NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

COST BENEFIT ANALYSIS OF INCLUDING BULGARIA IN A SYSTEM FOR COMMON SECURITY

by

Pavlin T. Roussanov

June 1998

Thesis Advisor: Katsuaki L. Terasawa
Associate Advisor: William R. Gates

Approved for public release; distribution is unlimited.

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1. AGENCY USE ONLY	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	June 1998	Master's Thesis

4. TITLE AND SUBTITLE COST BENEFIT ANALYSIS OF INCLUDING BULGARAIA IN A SYSTEM FOR COMMON SECURITY

5. FUNDING NUMBERS

6. AUTHOR(S)
Roussanov, Pavlin T.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Naval Postgraduate School
Monterey, CA 93943-5000

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES
The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government and those of the MoD of Bulgaria or the Bulgarian Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for public release; distribution unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(maximum 200 words)*

After the revolutionary changes in 1989 and following dissolution of the Warsaw Pact, Bulgaria remained alone and unsecured on the Balkan Peninsula. On 17 February 1997 the Bulgarian Government approved a decision on the country's full membership in NATO. This decision was reached after carefully considering of the possible strategic choices for Bulgaria's national security. All possible consequences (political, military-strategic, financial-economic, and social and legal) from this decision were taken into account. This thesis presents the real situation on the Balkans: economic conditions within Bulgaria and its neighbors, the countries' military expenditures, their armed forces, and arms transfers. In order to evaluate the costs and benefits for Bulgaria joining NATO and to show the advantages of integration, a model of NATO enlargement on the Balkans is created. The simulation of the model clearly shows that independent of the scenario of Bulgaria's integration in a system for common security on the Balkans, all of the countries included in this integration process benefit from it. These benefits include considerable drops in countries' military expenditures and increases in their national security. The methodology presented in the thesis could be used for further study in which the model would be expanded to incorporate the costs of membership and international advantages.

14. SUBJECT TERMS
National Security, Military Alliances, Model for Common Sceurity, Nash Equilibrium

15. NUMBER OF PAGES
98

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

Approved for public release; distribution is unlimited

COST BENEFIT ANALYSIS OF INCLUDING BULGARIA IN A SYSTEM FOR COMMON SECURITY

Pavlin T. Roussanov
Lieutenant Colonel, Bulgarian Air Force
Eng., Bulgarian Air Force Academy, 1982

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN INTERNATIONAL RESOURCE PLANNING AND MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
June 1998

Author: _____
Pavlin T. Roussanov

Approved by: _____
Katsuaki L. Terasawa, Thesis Advisor

_____
William R. Gates, Associate Advisor

_____
Reuben T. Harris, Chairman
Department of Systems Management

ABSTRACT

After the revolutionary changes in 1989 and following dissolution of the Warsaw Pact, Bulgaria remained alone and unsecured on the Balkan Peninsula. On 17 February 1997 the Bulgarian Government approved a decision on the country's full membership in NATO. This decision was reached after carefully considering of the possible strategic choices for Bulgaria's national security. All possible consequences (political, military-strategic, financial-economic, and social and legal) from this decision were taken into account. This thesis presents the real situation on the Balkans: economic conditions within Bulgaria and its neighbors, the countries' military expenditures, their armed forces, and arms transfers. In order to evaluate the costs and benefits for Bulgaria joining NATO and to show the advantages of integration, a model of NATO enlargement on the Balkans is created. The simulation of the model clearly shows that independent of the scenario of Bulgaria's integration in a system for common security on the Balkans, all of the countries included in this integration process benefit from it. These benefits include considerable drops in countries' military expenditures and increases in their national security. The methodology presented in the thesis could be used for further study in which the model would be expanded to incorporate the costs of membership and international advantages.

TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

A. THE NEW NATO

After the dramatic events in 1989 and the revolutionary changes of the following years the United States was left as the sole superpower and NATO the sole alliance. In less than 10 months, on 4 April 1999, NATO will celebrate its 50th Anniversary. Despite this fact the Alliance has demonstrated a remarkable ability to adapt to the changing world and to equip itself with the necessary new ideas to ensure that it will remain an effective and relevant Euro-Atlantic security institution in the 21st Century [2].

The end of Cold War provided a stimulus for introducing NATO's new strategic concept. This concept, accepted in Rome in November 1991, raised the question about NATO's future as a military organization. The participants in the summit agreed that the "Threat of a simultaneous, full-scale attack on all of NATO's European fronts has effectively been removed and is thus no longer a focus for Allied strategy." However, new potential dangers arise from the wreckage of the Soviet block—ethnic tensions in the new republics, territorial disputes between former members of the Warsaw Pact, grave economic crisis in these countries. The new strategic concept looked ahead to a minimal force, nuclear and conventional to cope with problems stemming from instability and disorder rather than from the single powerful entity that NATO had confronted for many years.

Today, with the changing security environment, integration has become the defining characteristic of the political environment in Europe. A European architecture based on indifference cannot be a stable construction. So the enlargement of NATO is a strategic imperative. It is an investment in a secure Europe. The process of NATO enlargement started in July 1997 in Madrid with the invitation to former members of the Warsaw Pact, the Czech Republic, Hungary, and Poland, to join the Alliance.

The Heads of State and Government at the Madrid meeting also reaffirmed that the door remains open to other European nations which aspire to Alliance membership, giving them an opportunity to demonstrate their ability and willingness to assume the responsibilities and obligations of the North Atlantic Treaty. No European democratic country whose admission would fulfil the objectives of the Treaty will be excluded from consideration.

At Madrid, the Participants also recognized the positive movement toward democracy and the rule of law in a number of Southeastern European countries. They recognized the need to build greater stability, security and regional cooperation in the countries in this sub-region of Europe, and the need to promote their increasing integration into the Euro-Atlantic community. "This specific recognition of Southeastern Europe should put to rest any notion of relegating this region to an area of secondary importance." [8]

B. BULGARIA'S CHOICE

1. Application for membership

On 17 February 1997, after years of unclear intentions, the interim Bulgarian Government unanimously adopted a decision on full membership in NATO. In Bulgaria, joining NATO is regarded as an expression of the country's traditional membership in the Euro-Atlantic civilization and a natural component of its striving to integrate in its major economic and defense institutions. Text in the National security Concept, adopted on April 16, 1998, says: "Bulgaria's national priority is its NATO membership."

The debate concerning the Bulgarian attitude toward NATO is often oversimplified, referring only to its military side. However, this problem has many aspects with roots in the political and military spheres, as well as in the economy, the legal system, the social situation, and even in the psychological disposition of the population and the political elite.

The strategic choice in Bulgaria's national security was between three alternatives: creating a Bulgarian neutrality system within the European security architecture; integrating with the future European defense identity in the system of the European Union (EU); or the Bulgarian integration in the structures of the North Atlantic Alliance, assuming that NATO, with its enlargement to the East, will evolve into a system of collective security.

Each one of these choices has its advantages, which are supported and defended by wide circles of politicians and public figures. Support for these options is based on specific historical and current political arguments.

2. The Neutrality as an Alternative

It must be admitted that the "neutrality" alternative is exceptionally tempting, especially considering that all main Twentieth century events in Bulgarian national security policy have ended with failure from a political point of view. Examples of fiascos of Bulgarian policy during the Twentieth century include the outcome of the Allies war (1912-1913), the First World War (1916-1918), the Second World War, and finally the Cold War. Most of Bulgaria's misfortunes result from the fact that the country has been integrated into one or another opposing coalition and by a sad coincidence of events, the chosen coalition has always been the losing side. This is the main historic argument supporting the thesis of some Bulgarian politicians and public figures—fighters for Bulgaria's policy of neutrality.

In assessing this idea we should decide if the proposed neutral status of Bulgaria could be implemented now or in the foreseeable future. There are three types of neutrality: traditional, structural, and satellite neutrality [7].

a) Traditional neutrality

This is a fully unrealistic idea. Many years of active neutral status are needed to integrate a country into a balanced international system, and to ensure potential adversaries will have no interest in its destruction or violation.

b) Structural neutrality

This system has been implemented in Austria since 1955 and in Yugoslavia after 1949, but it evolved in quite a different international environment. The bipolar system in Europe that precipitated this type of neutrality doesn't exist anymore. The new international system replacing the previous one needs a long time to form, modify, and stabilize. Considering the current situation in international relations, we can assume that establishing this type of stable neutrality status will encounter huge obstacles in the present international situation. There is no a major player in Europe interested in and ready to guarantee the status of structural neutrality for a small state in the European periphery.

c) Satellite neutrality

An example for this type of neutrality is Finland after the WW II. This neutrality was achieved through a direct linkage with the former USSR. This neutrality variant is somewhat preferable to the previous two alternatives, but it also has weak aspects. Satellite neutrality may allow Bulgaria to receive serious foreign support, but will require that Bulgaria strictly support the interests of its "protector." For many years, Bulgaria followed this type of neutrality as well as a direct attachment to one or another great power. Continuing this policy in the context of the changing international relations inevitably will lead the country to a new national disaster. Considering the dynamics and unpredictability of the international processes, even the linkage to a stable and strong international power can not guarantee Bulgaria a long-term defense of its national interests.

3. The European Security and Defense Identity as an alternative

Launched in 1948 by the UK, France, and the Benelux states as a response to a growing Soviet threat, the West-European Union (WEU) has remained for many years in NATO's shadow, fulfilling a symbolic and potential role—but no real function. Today, WEU is emerging from that shadow and now has both greater responsibilities and military and organizational capacities than at any time in its 50-year existence.

The WEU has four main, although limited, functions. Together, they are enough to justify the organization's existence and to make strengthening it a good idea in principle.

- Identity and visibility. WEU gives an "identity" to European security and defense efforts that the Europeans strive to maintain and strengthen after the Cold War. In supporting this idea NATO adopted a declaration to develop a European security and Defense Identity (ESDI) in January 1994, and agreed to create WEU-led Combined Joint Task Forces (CJTF) in June 1996.

- Performing military missions. WEU has already performed some military missions, however most of them were under NATO; the WEU label was primarily symbolic. In the future, the organization may acquire a more practical military role.

- Extending to the East. In addition to its ten full members, the WEU has three Associate Members, nine Associate Partners (including Bulgaria), and five observers. This makes the WEU Europe's only security organization involving nearly all the Europeans, but excluding the US and Russia. WEU outreach is a useful way of involving non-EU members in important and practical steps for enhancing European security. An example is the participation of Bulgaria in the WEU's Danube operation during the war in Yugoslavia.

- Providing for Europe's defense. Article 5 of the WEU treaty requires all signatories to give "all the military and other aid and assistance in their power" to any of the allies that are the object of an armed attack in Europe. But as long as NATO persists in Europe, it is hard to imagine a full-scale attack over a state member of WEU. NATO

remains Europe's defense guarantee; if the WEU has to play military roles, they are beyond the borders of its current members.

The association and eventual incorporation of Bulgaria in the EU is important from a national security point of view. First, it is expected that Bulgaria's membership in the EU will help us to overcome the backwardness of our technology. Second, it is possible to obtain additional security guarantees connected with the growing EU tendency for coordinating the foreign policy. Finally, it will increase opportunities for a wider partnership in the area of domestic problems, including co-operation for preventing terrorism, illegal drug-traffic etc.

Becoming a future EU member, Bulgaria should be able to cooperate in all three main "columns" of the EU: the free movement of people and goods; cooperation in the field of foreign policy, security and defense; cooperation in the internal affairs, legal systems and the entire complex of measures connected with the fight against the organized crime, including the traffic of illegal drugs and weapons. As an Associate Partner, Bulgaria has an obligation and interest in adjusting its system to the EU requirements, so that when it becomes a full member of the Union it will be a reliable and effective partner in all three "columns."

However, transforming the idea of a European Security and Defense Identity into a viable and effective structure with significant attractiveness for the entire continent, requires at least three main prerequisites:

- establishing a federal EU with common foreign and internal policies;
- developing integrated conventional armed forces; and
- forming an independent European nuclear potential.

Bulgaria has to prove its potential as a factor in the security and progress in South Eastern Europe, especially in forming a Common Foreign and Security Policy (CFSP) and a Common Defense Policy (CDP) within the EU. By full commitment of its policy to this strategic goal, Bulgaria must convince the EU to "discover" it as a key country; as a point of support for the interests of the Union in South Eastern Europe. These interests should be based not only on creating a shield against the potential threats for the European

security, but also on the real possibilities for Bulgaria to play a stabilizing role using the means of cooperation and interaction with the EU as well as with the other countries in the region.

We must, however, emphasize the fundamental association between the European Security and Defense Identity and NATO. The North Atlantic Treaty Organization is and will be a fundamental instrument of the common defense of the integrated part of the Euro-Atlantic space. The other institutions and functional mechanisms will service additional roles and missions.

Analyzing the current situation, the choice of the leading national ideal is to be the determining factor for the adequacy of each of the alternatives for the national interests. The main hypothesis ruling the discussion on this problem is that Bulgaria's total integration into the existing and developing European structures is generally accepted. The Bulgarian choice "to be in Europe" has no alternative. The main assumption is that Bulgaria joining NATO is a step that will legitimize the clear interests and goals of the country, and move it ahead towards full integration into the European civilization.

4. NATO as an Alternative

Never before has NATO's significance and role for security in Europe been so clear and above doubt. After the end of Cold War, lacking an imminent military threat, the most fundamental reason for the cohesion of the Atlantic Alliance is weakening.

NATO, however, will not disappear. Many challenges to the interests of the US and Europe remain. When we add the common culture and values, we will create a bias towards transatlantic integration. If Americans want to preserve the credibility of a proven Alliance, they should demonstrate their continued commitment, even when the commitment has a cost. Europeans should do all they can to ensure American involvement, but they should prepare for a day when US commitment will begin to wane.

It is obvious that some reforms in the Atlantic Alliance have to be carried out having in mind two questions [7]:

a) What ideas of the Washington Treaty have to be preserved?

The answer to this question refers to the philosophy of the Alliance at its establishment (1949), most precisely expressed in the words of its first chairman, Lord Ismey: "NATO was created to hold the Russians out, the Americans—in, and the Germans—down." According to today's realities this formula is generally interpreted in the West as follows [7]:

- NATO has to continue to involve the USA in European security;

- NATO has to maintain its organizational and administrative structures and procedures to remain a successful instrument for preserving security by its tactical military power;

- NATO has to continue to restrain the development of national military forces by their integration into the Alliance's structures and using different forms of their restriction through international legal instruments; and

- NATO has to continue to participate in maintaining the balance and the military dimensions of the parity with the existing European military superpower—Russia. More precisely it should not allow abuse with military power in international relations.

b) What changes have to be made so that NATO becomes what Europe needs—an effective common security system?

The answer to the second question refers to the necessary changes for NATO to become what Manfred Werner called an "anchor of the European security." For its transformation from a military-political Alliance into a common security system, NATO obviously has to change [7]:

- the conceptual balance between the two columns of the Alliance, the European and the American, which can be achieved through the redistribution of priorities and responsibilities;

- the main concepts of the allied military strategy as well as the related military structures and procedures for politico-military decision making;

- the concept of the relations with Russia; and

- the understanding of its role in zones outside the ones determined by the Washington Treaty (Article VI).

The answer to the first of the above stated questions depends entirely on the prerogatives of the NATO member states, while the solution of the second is much more complex. To create an effective common security system from the existing defense organization NATO, all states which have a vision of the common European security can not only express opinions but may also have a direct influence. This aspect pragmatically focuses the work on the consequences for Bulgaria of eventually joining the Alliance, transformed as a system for common security and defense.

C. BULGARIA IN NATO: POSSIBLE CONSEQUENCES OF INTEGRATION

Including Bulgaria in the Euro-Atlantic structures will substantially affect the country's internal and external policy. The new status of Bulgaria will be connected with changes in the decision-making system, in the system of defense, and in the national system for defense control. This will have a powerful impact over the civil-military relations and on the defense industry. All these changes will possibly lead to secondary changes in the social sphere. They will bring new elements to the Bulgarians' psychology and mentality.

Considering the simultaneous effects of different factors in the process of joining NATO, it is necessary to assess its positive and negative sides. We need to fulfil this assessment in order to achieve the multiple positive effect from the full membership.

1. Political Consequences

Estimating the consequences of joining NATO, we should know that after the end of the Cold War the political considerations dominate by their range, depth, and influence over the military ones. The most important among them are [7]:

a) Positive consequences

• Final and unambiguous political choice.

The country joins a democratic world with clear parameters, rules, and perspectives. In the new reality Bulgaria will have an opportunity for a successful development and full use of its national sovereignty. Being a member of NATO, the sovereignty of the country will be guaranteed to the extent that the Alliance forces the allies (and not only them) to conform to it. The implementation of this mechanism requires political consultations based on clear and worked out principles and traditions: the fair exchange of opinions and positions between governments; the desire to respect the interests of the different member states, independently of their political, economic and military power; and understanding that successful co-operation means sharing the threats and guarantees as well as the responsibilities and benefits. Joining NATO we will enter an environment where we can develop our national security strategy framed by certain rules and according to the common interests but fully respecting the national goal and priorities.

• Political and military system with great potential and international prestige.

It is generally recognized that NATO is a successful alliance. Contrary to expectations, the alliance did not lose its motivation for existence after the collapse of the Warsaw Treaty. Today nobody doubts the ability of NATO to play the most important role in creating a common foundation for a new European security system. The reason for benefit of the zone of security and stability that NATO extends over its members is that it is simple and reasonable national security to be guaranteed by a multinational organization.

• Preconditions for new political, economic and military relations with the leading countries of the world.

Joining NATO, Bulgaria enters a zone of higher security that automatically will change positively the political and economic attractiveness of the country. The excuses of foreign investors about the unsuitability of conditions in capital investment will be neutralized to a certain degree. We will have a real opportunity to conduct regular consultations at the highest political level, which will have direct positive consequences for

policy, security, and the economy. Six of the seven most developed countries of the world who control the international financial institutions are NATO members. It is politically inadmissible to pass the possibility to join the Alliance, especially when the country has such enormous needs for support in practically all spheres. Joining NATO will strongly consolidate the Bulgarian position on its road to a full EU membership.

• A basis for a new stabilization process in South-Eastern Europe.

In this new by its character, scale, and potential process Bulgaria can play major roles. Joining a system for common security, Bulgaria's regional policy will gain a completely new direction and weight. The policy of active neutrality as applied during the Yugoslav crisis could be replaced by a policy of cooperation, interaction and involvement. All conditions are at hand for Bulgaria to become a positive influence for regional security. Combining the accumulated experience with the support of NATO can provide us with dividends that will fully "cover" the possible negatives of joining NATO. Being a member of the Alliance, Bulgaria will find itself in a situation where most of the countries in the region will have coinciding strategic interests instead of strategic contradictions.

• The external guarantees of national security will provide deterrence that in Bulgaria's case is much more valuable than the ability for immediate defense only.

• Adaptation of the country to numerous NATO standards, documents, and agreements.

This process will also simultaneously solve a series of problems, including: consolidating the division of authority, formatting democratic civil-military relations, and adopting appropriate rules for people and goods crossing the borders. A new internal and external environment will be created, favorable for international economic projects of strategic significance. Better possibilities for participation in the international division of labor in the sphere of defense will be created.

b) Negative consequences

The political consequences of joining a system for common security may be assessed considering those factors that in a certain stage and at a certain degree could be

negative for some aspects of Bulgaria's national security. The most significant among them are:

- Joining NATO, Bulgaria will have to form a new system of political decision-making resembling the spirit and style used in NATO. In the beginning, the system may cause political and public dissatisfaction that in exceptional and electoral situations might represent a serious danger. An important reason for such possible consequences lies in the insufficient information concerning the status, the activities and the perspectives of NATO available both to politicians and the general public.
- Being a member of the Alliance, Bulgaria could be an object of a nuclear attack during a global conflict, regardless of whether or not nuclear weapons are based on its territory. Although such a possibility has a limited probability, it should not be ignored.
- In 1997 NATO made a decisive contribution to achieving a new Europe, undivided, free, and secure. Despite the NATO-Russia Founding Act and Russia's inclusion in the PfP program, our relations with Russia will be changed and complicated, at least in the beginning. For a certain period, Bulgaria may have difficulty with its strategic resources; the armed forces may face supply and maintenance problems.

2. Military-Strategic Consequences

The military-strategic consequences are especially important not only for Bulgaria's membership in this system for international security, but also for the NATO expansion in general. Unlike political consequences, the military consequences are visible, measurable, and controllable. The paradox is that the positive consequences for our country might be negative for NATO itself. In this case, it is important to evaluate even numerically both positive and negative consequences for Bulgaria from a military-strategic point of view. For Bulgaria's national security the positive and negative consequences are as follows [7]:

a) Positive consequences

- The problem of the country's negative defense balance with our neighbors in the context of CFE will be addressed, though not solved.
- The allied status will offer the best opportunities for rational and most effective use of the national resources in the spheres of defense and security.
- The entire territory of Bulgaria will become an integral part of the European defense zone under NATO control.
- The deterrent potential of NATO's political and military power will increase the ability of our country to effectively influence the escalation of the international disputes, conflicts and crises directed against the state and its interests.
- Military intelligence information available from NATO will help the decision making process on problems which are of strategic importance for the national security.
- A coalition military doctrine that meets the requirements of the contemporary world will be adopted. At the same time, the specific military planning corresponding to the national requirements will be maintained.
- NATO membership will help accelerate reorganization and modernization of the forces that Bulgaria places under Alliance management.
- Bulgarian experts and research institutions will gain expanded access to state-of-the-art technologies in weapons, communications, and equipment.
- The process of a gradual standardization in the defense will be initiated by introducing more sophisticated armament and equipment than the country could now afford.
- Broad participation in different peace keeping missions will have a positive effect on personnel training and on the combat training of the military units.
- The Bulgarian government will be obliged to follow certain rules in their defense policy, including in the financial and material provisions for defense.

b) Negative consequences

The **negative** military-strategic consequences of the Bulgaria's integration in NATO will be a function of the geopolitical location of the country rather than of the specific military policy that the Bulgarian government could adopt.

- In accordance with its allied duties, Bulgaria could potentially be directly or indirectly involved in a military conflict linked with any member of NATO.
- The possibility of a military conflict emerging at the border of NATO's zone of responsibility is the dominating military threat that can expand and escalate involving members of the Alliance.
- The threats of terrorist activities against "the West" and NATO in general can make Bulgaria a target as well. This possibility is especially dangerous in the context of the fundamentalist expansion.
- Joining a system for common security, Bulgaria will be obliged to accept some kind of foreign military presence: traffic through our air space and territorial water; multinational military exercises; establishment of infrastructures, communication centers and channels; access to air traffic and naval control and navigation, etc. Bulgaria should allow access to important information, including the country's mobilization resources.
- As a NATO member, Bulgaria will be in the periphery of its responsibility zone that makes the country automatically an object of high intelligence interest for non-NATO members.

3. Financial-Economic Aspects

In the political debate on Bulgaria's joining NATO, the financial aspect is being considered mainly by the opponents of the integration in an oversimplified manner. They overwhelm the society with misleading information based on the following assumptions:

- the expenses for joining are detached artificially from those for the national defense and security that unconditionally have to be made anyway;

• the expenses for joining are presented as a total cost without any explanation about time period over which they will be spent, i.e. joining NATO is regarded as an act rather than as a bilateral process which continues for a long time—more than 10 years;

• there is no analysis regarding the possible contribution of the national defense industry (and possible benefits for the country) in the process of a technical rearmament; and

• the specialists in Bulgaria who are acquainted with standardization in NATO are still few; they are not familiar with the process of standardization and the future technical modernization of the NATO armed forces according to the concept of the Combined Joint Task Force (CJTF), the NATO programs concerning investment in different spheres of the security, applied and scientific research, infrastructure, communications etc.

In this thesis it is impossible to address the problem thoroughly. However, it is important to discuss the relation and the interdependence of defense expenses. It is also important to discuss the strength of the armed forces at a strategic level and the perspective for their modernization.

The analysis of the financial and economic side of the problem has to produce an answer for three fundamental questions:

a) "Adequacy" of the financial efforts that has to be made

What resources are required for defense and security to achieve the established political goals without harming the economic stability and the potential for steady development of the country?

b) The "economy" of the financial efforts of the member state

How to ensure efficiency in the defense and security related expenditures incorporating the Alliance's cooperation and specialization possibilities and the particular interest of every member state?

c) The "fair" financial effort of each member state

We can restate this question as how equitably to distribute the financial burden among the Alliance's members?

According to the NATO definition, a country's defense expenses include:

- all expenses for the national armed forces including pensions for retired servicemen and civilian military personnel;
- the expenses of the host country for the NATO forces, units or structures from other countries;
- the NATO determined common financial payments covering the expenses of the civil and military personnel of the Alliance and the allied infrastructure;
- the military (financial and material) aid for other countries; and
- the expenses for paramilitary structures that are important for defense.

Table 1.1 shows the Gross National Product (GNP) per capita for the world, for NATO, for NATO members on the Balkan Peninsula—Greece and Turkey, and for Bulgaria. The available data are for the 11 years from 1985 till 1995. Data are presented in thousand constant 1995 dollars calculated according to their Purchasing Power Parity (PPP) [12].

Comparing Bulgaria's GNP per capita with that for the world, we see some equality. During the 80's, Bulgaria's GNP was slightly above the world average; during the 90's it was slightly below the world average. The main reason for the decreasing relative Bulgarian GNP during the later period was the grave economic crisis after the collapse of COMECOM (Council for Mutual Economic Assistance). At the same time, Bulgaria's economic data are well below the average data for NATO, but they are between the Greek and Turkish data for GNP per capita. Considering that Greece and Turkey are our neighbors on the Balkan Peninsula, and important members of NATO in this region, Bulgaria's economic performance is relatively good and should not serve as a reason for considering Bulgaria as a "secondary candidate" in this sense.

Year	GNP per capita in thousand constant $ 1995				
	World	NATO	Greece	Turkey	Bulgaria
1985	5.246	19.410	7.656	2.100	6.316
1986	5.317	19.850	7.729	2.240	6.468
1987	5.397	20.280	7.687	2.423	6.473
1988	5.546	20.930	8.044	2.438	6.668
1989	5.634	21.460	8.264	2.367	6.609
1990	5.618	21.210	8.114	2.536	5.805
1991	5.558	21.100	8.326	2.525	4.574
1992	5.346	21.310	8.351	2.618	4.476
1993	5.337	21.320	8.414	2.775	4.438
1994	5.402	21.790	8.505	2.597	4.435
1995	5.459	22.090	8.696	2.714	4.394

Table 1.1. GNP per capita

Table 1.2 shows armed forces per 1,000 people for the world, for NATO, for NATO members on the Balkan Peninsula, and for Bulgaria. These data are for the same 11 years—between 1985 and 1995 [12].

Year	Armed forces per 1,000 people [soldiers]				
	World	NATO	Greece	Turkey	Bulgaria
1985	5.8	9.3	20.2	16.1	21.2
1986	5.8	9.4	20.3	16.6	21.2
1987	5.7	9.3	19.9	16.6	21.3
1988	5.6	9.2	19.9	15.7	17.8
1989	5.5	8.9	20.0	14.2	16.6
1990	5.3	8.5	19.9	13.7	14.4
1991	4.9	8.2	19.9	14.1	12.0
1992	4.5	7.5	20.1	12.1	11.2
1993	4.3	7.1	20.5	11.6	6.1
1994	4.2	7.0	19.7	13.4	9.4
1995	4.0	6.7	20.3	13.1	10.0

Table 1.2. Armed forces per 1,000 people

The obvious conclusion is that the number of the military personnel relative to the Bulgarian population is almost twice as high as the average for the NATO members. This proportion is much higher when we compare our armed forces per 1,000 people with the average for the world. While Bulgaria's data in the 1990's are lower than those for Greece and Turkey, they are still substantial. According to NATO's interest in our possible membership, this should be considered as a positive factor.

Table 1.3 contains the Military Expenditures (ME) per capita for the world, NATO, NATO members on the Balkan Peninsula, and Bulgaria in constant 1995 dollars for the same 11 years [12].

Year	Military Expenditures per capita in constant $ 1995				
	World	NATO	Greece	Turkey	Bulgaria
1985	275	907	538	97	890
1986	276	935	480	110	926
1987	272	932	487	80	931
1988	265	908	505	72	816
1989	252	900	477	74	784
1990	241	855	475	89	498
1991	217	780	450	94	181
1992	193	787	472	100	145
1993	174	748	466	108	128
1994	161	710	472	105	118
1995	152	668	482	108	125

Table 1.3. Military expenditures per capita

Due to the low level of the budget expenses for defense in the 90's, the military expenditures per capita are much lower in comparison with the average numbers for NATO and for Greece. However, those numbers are slightly higher than in Turkey. Looking at military expenditures of Bulgaria in late 80's, we may conclude that after restoration of country's economic performance, Bulgaria could increase its military efforts if necessary. In this case, Bulgaria would be an important member of NATO and contributor to the European security on the Balkan Peninsula.

Although incomplete, the analysis outlines the type of problems, which have to be solved and to be taken into account in the integration policy:

• It is possible that NATO will not translate the financial question into a main problem of the negotiations concerning admitting new members, including Bulgaria. NATO is well aware that immediately increasing the requirements for financial cooperation will decrease the general economic indicators of the candidates, increase social tension, and decrease of the attractiveness of the NATO membership.

• Costs of NATO enlargement

The February 1998 Report to the Congress on the Military Requirements and Costs of NATO Enlargement states that [14]: "The addition of three invitees (Hungary, Poland, and the Czech Republic) will require approximately $1.5 billion in NATO common-funded costs over the next ten years (from 1998 through 2008). The United States currently provides about 25 percent of these common-funded budgets, and will continue to do so after the addition of the new members." The US costs of admitting the first three countries into NATO will be no more than $400 million for ten years, approximately the same cost absorbed by the three invitees. There is no appropriate calculation of the costs of accessing Bulgaria into the Alliance, but knowing the size of the country, its military, and the current practice we can drew some conclusions.

The cost of including of Bulgaria in this future system for common security will be approximately $300-400 million over the first ten years and the country should pay a small portion of it. This portion will be no more than $100 million.

• Independently of the current perspective to successfully integrate new members into NATO, Bulgaria should participate in all existing NATO cooperation programs for armed forces modernization in order to prevent any military crises. We should strive to gain as much external military aid as possible. We should seek NATO assistance for solving concrete problems in our armed forces, involving the Alliance with our problems at an operative level and provoking higher political interest.

• Developing the concept for the Combined Joint Task Force will profoundly change the direction of NATO's efforts. It is possible that the character of the military

activity and the related expenses can be changed in a manner that this inevitably will influence all countries on the continent. The new NATO function as an instrument for military conflict prevention will require a new approach to the structure of the military forces, their training and complex maintenance. The exact CJTF formula is still not formulated in NATO so Bulgaria can participate in the process from the very beginning.

• The alternative political choice - guaranteed neutrality - from the point of view of the related defense costs, has a similar financial price as NATO membership. If we consider, however, the need for total technological innovation in the medium aspects, the expenses for neutral status will be beyond Bulgaria's ability to pay.

4. Social and Legal Consequences

The integration process inevitably will reflect on the legal system of national defense as well as on numerous aspects of the social sphere. Joining NATO assumes that military personnel will migrate to and from Bulgaria, and that there may be a constant foreign military presence including weapons. From a legal point of view, a normative environment has to be provided as close as possible to the one in the Alliance. In this respect, it will be necessary not only to conclude a considerable number of agreements (bi- and multilateral) but also to ensure real conditions for their observance (tax regulations, visas, documentation etc.).

The problem of using and controlling Bulgarian forces on foreign territory will have to be regulated in a much more detailed way than is done in the Bulgarian Defense and Armed Forces Law (BDAFL). Moreover, the rules have to conform to the ordinary training activities of the units with different scales as well as with the cases demanding urgent action in accordance with CJTF.

The establishment of the civil-military relations in Bulgaria has to be accomplished during the admission process. The law in force (BDAFL) is far from sufficient. The adoption of an alternative service law, laws concerning different institutions associated with the armed forces activities, a new formulation of the State and Military Secrets Law, laws regulating financial and economic obligations of the judicial subjects toward the

mobilization and combat readiness of the country etc. are especially needed. Moreover some corrections in current normative acts have to be made, motivated by the experience accumulated in their application as well as by the specific requirements of the NATO membership.

In the social field, the changes will be determined by the admission formula: either full membership with the whole scope of rights and obligations referred to in the Washington Treaty or a "restricted" membership. In both cases, however, the most important social question probably will be the further professionalization of the armed forces.

The presence of Bulgarian forces on foreign territory, the participation of Bulgarian military personnel in the allied command structures and control and logistic structures will introduce completely new dimensions compared to current practice. The intensified international activity will not only increase the requirements on generals, officers and sergeants, soldiers and civil personnel, but also will inevitably increase the prestige of the military profession, of its social status and attractiveness.

The extension of allied missions and elements of its infrastructure will change the social climate in the regions concerned. The changes have to be foreseen and controlled purposely to prevent potentially negative aspects and to promote positive ones.

Concluding this section, an important condition concerning the methodological base of the policy regarding NATO has to be outlined. The positive and the negative aspects of membership should not be balanced by "a simple counting." NATO membership should not be considered separately from Bulgarian participation in the All-European process. As was already emphasized, the starting point of any national policy is the leading national idea. If this idea is common welfare, political responsibility for Bulgaria's future and strategic thinking, then it will be possible for the government and society to block and neutralize the negative factors and to develop and realize the positive ones regarding attitudes towards the Alliance.

D. BULGARIA OUTSIDE NATO: POSSIBLE CONSEQUENCES OF NON-INTEGRATION

There is another potential alternative for Bulgaria—staying outside NATO. It unites many sub alternatives, primarily involving the theme of "neutrality." Some general comments about the possible influence of the "non-NATO" option on the general political future of Bulgaria and on its national security are presented here. In particular [7]:

- The process of implementing Bulgaria's strategic goal—a full membership in the European political, economic, and defense structures—will be delayed considerably. The economic conditions which the country has to achieve will become the primary concern for EU membership (i.e., there the economic corrective on the political and economic advisability will be missing). The attitude towards Bulgaria will reflect the judgement that if a country is not attractive from a strategic and military-political point of view then it is not suitable for economic expansion as well.

- Bulgaria will find itself in the buffer zone between the West and Russia and for a long period will be considered an unattractive partner in the political and economic spheres. The political will of the international financial institutions for supporting broad structural reforms will decrease sharply.

- External guarantees against the traditional sources of military threat will not be provided. There will not be only real chance to benefit from any support for our national security priorities.

- In domestic aspect the ideas for restoring of the status quo before 1990 will be revitalized systematically. A strong motive for seeking abstract external and internal political alternatives will be generated, that will lead to a non-productive waste of national resources and to a permanent "pendulum syndrome" in political affairs. This inevitably will generate permanent interest by regional superpowers in our internal affairs.

- Restructuring and modernizing of the armed forces will become a self-perpetuating process. The technological backwardness in all defense spheres will aggravate the negative security balance with our neighbors.

- The feeling of insecurity of the state and the nation will be permanently implanted into the Bulgarian's mentality. The impression of isolation and hostility by "the Europeans" will increase. The political contradictions between the generations will deepen; the accusations about lost chances will become a strong motivating factor in political debates.

- Economic problems and insecurity will encourage the emigration of young Bulgarians. Added to the natural decline of the nation, emigration will generate more serious problems after one generation.

Numerous other consequences can be listed as a result of Bulgaria's decision for abandoning the integration policy. However, the main consequence is that Bulgaria will need to seek another political model, other systems of values, and other mechanisms for guaranteeing the national security. Strategic political solutions should carefully consider whether Bulgaria is a suitable country to implement the new political model.

E. SUMMARY

At the moment and in the beginning of next century NATO enlargement will be the most dynamic process in the architecture of common European security. Its intensity and priorities will be mostly influenced by the following factors: accomplishing the SFOR in Bosnia and Herzegovina; developing relations with the Ukraine and Russia; Bulgaria's integration within the EU; the WEU's ability to prepare for future missions; and the willingness and ability of the candidates for EU membership to comply with the program-minimum for joining.

Bulgaria's policy towards NATO integration is one of the greatest challenges in the transition period. By deciding to join the Alliance, Bulgaria makes its final political choice. Joining NATO will rapidly change the national defense system and the guarantees for national security. NATO membership will provoke new goals and targets for foreign and domestic policy. It will mean taking new responsibilities. But the implications for

missing this chance when the country gravely needs assistance are politically unacceptable. Moreover, it should be remembered that the NATO states practically control international financial institutions; this obviously will be a leading factor for economic transition in Bulgaria. Joining NATO will consolidate Bulgaria's position on the path to a full membership in the EU.

NATO membership is creating a wide basis for establishing a new character, scale, and potential participation in different international institutions. Contacts provided through NATO represent the leading countries in the security sphere, including the USA, Germany, France, and the UK. Russia takes part in the discussion of the European security problems. National interest obliges us to be a part of the Common-European process. We have to be aware of the attitudes and the tendencies in the security structures and in the policy of leading European countries and our neighbors to prevent surprises from political or security decisions. We have to participate in the decision making process, especially in decisions that ultimately concerns us. All activity in the foreign policy, economy, security, and defense spheres has two main goals: (1) establishing a political, economic and social model which contributes as much as possible to improving the people's welfare, and (2) guaranteeing personal, public, and state security at the highest possible level.

II. BACKGROUND

A. MILITARY STRENGTH AND NATIONAL SECURITY

1. Changes in 1990's

Since the early 1990's, the national security of Bulgaria has been guaranteed through conditions that are radically different from those in previous decades. The disintegration of the Warsaw Pact raised the issue of Bulgaria's membership in NATO (along with the other countries of the former Eastern block). The question arose as a natural response to the changed geopolitical conditions, not through the current European policy agenda.

Changes have occurred in the regional context. The Balkans has become an arena of military conflict within the former Yugoslavia. The outcome of this conflict was the emergence of some new states—Slovenia, Croatia, Macedonia, and Bosnia and Herzegovina. This constitutes a threat as different ethnic groups live together in the region within separate independent states.

Domestic conditions in Bulgaria have changed substantially in the post 1989 period. This has had a direct impact on national security. The democratization of society has called for the depoliticisation of the armed forces, the enforcement of civilian control over the military and special services, and the creation of civil society structures, some of which relate to national security. Economic changes to create a market economy have called for new ways and means to supply and support the armed forces and maintain of the military defense production and trade complex.

Under these conditions, Bulgaria started establishing a new national security system. The new system rests first and foremost on the democratic principles laid down in Bulgaria's Constitution. The new Constitution (1991) was followed by a series of laws

pertaining directly or indirectly to national security. Questions pertaining to the police force and the special services, the state secret service, the institutional changes in security were codified. At the close of 1995, the Law on Defense and Armed Forces was passed after five years of drafting under three National Assemblies. Along with regulating professional and institutional matters for the first time, this law treats the Bulgarian military as citizens having all rights laid down in the Constitution; it specifically lists the rights that are curtailed in the interest of national security.

Along with legislative changes in the country's national security processes, change and adjustment are occurring in the existing national security structures. Some predominately political organizations were disbanded (like the Volunteer Detachments or the Organization for the Assistance of Defense) or adapted to the changed conditions (like the Civil defense which was transformed into Civil Protection and a number of other key elements of the country's national defense organization); reorganization is still under way in the armed forces.

These changes have become publicly known as the military reform. Reorganization has progressed at a varying pace in the past seven years. A 1995 decision of the Council of Ministers approved the program for reform in the Bulgarian military through 2010. The democratic joint command of the national security system is gradually gaining currency. This structure resulted from the actions of the National Assembly, the President of the republic, and the Council of Ministers. In complete harmony with the international instruments, the Bulgarian national security system is transparent and sufficiently open to external control in compliance with the concluded treaties and agreements.

Bulgaria took part in the peace-keeping operations in Cambodia; strictly enforced the imposed Yugo-embargo; participated in joint NATO exercises within the framework of the Partnership for Peace initiative; and observed the commitments under the Treaty on Conventional Armed Forces in Europe (CFE Treaty). Bulgaria pursues a peaceful and constructive foreign policy internationally and on the Balkans.

In many ways though, Bulgaria's actions in the field of national security involve tremendous challenges and risks to security.

2. Risks to security

The risks to security are many and vital. One of the most important reasons is the growing imbalance in the armed forces and potential of Bulgaria vis a vis its neighbors—Turkey, Greece, and Romania. This imbalance, which favors our southern neighbors, results from implementing the Cascade Plan within the framework of the CFE Treaty. This plan provides that arms from central Europe should be transferred to the European periphery in order to achieve balance along the entire NATO border. That balance was struck when the Warsaw Treaty was in place and is creating a growing imbalance vis a vis Bulgaria today. According to SIPRI, the USA alone has gratuitously given 1993 tanks, 636 armored vehicles and 180 artillery systems to Greece, Turkey, Norway, Portugal, and Spain. The results of implementing of the CFE Treaty on the Balkan Peninsula can be seen on Table 2.1 [Almanac Bulgaria]:

	Bulgaria-Turkey		Bulgaria-Greece		Bulgaria-Romania	
	Before	After	Before	After	Before	After
Personnel	1:5.09	1:5.09	1:1.61	1:1.5	1:1.45	1:2.2
Tanks	1:1.19	1:1.9	1.40:1	1:1.17	1:1.18	1.07:1
Armored vehicles	1.2:1	1:1.56	1.08:1	1:1.2	1:1.55	1:1.05
Artillery	1:1.29	1:2.0	1.27:1	1:1.07	1:1.54	1.18:1
Combat aircraft	1:1.52	1:3.2	1:1.24	1:2.76	1:1.05	1:1.8
Combat helicopters	44:0	1.5:1	44:0	1:1.49	1:2.36	1:1.56

Table 2.1. Basic indicators for Bulgaria and its neighbors

The table gives the relative balance of military components before and after the enforcement of the Treaty. Despite the negative effect that implementing of this plan has on the country, Bulgaria has stuck to its commitment under the CFE Treaty in the name of understanding and peace.

Another reason for the difficulties facing Bulgaria's national security includes disrupted technological relations with countries of the former Eastern Bloc. This tests Bulgaria's maintenance and operation of military technology and arms in the military. Bulgaria's most recent military equipment purchases include [Almanac Bulgaria]:

Aircraft (SU-25 fighters)	1988
Tanks and combat helicopters	1985
Armored vehicles	1987
Anti-tank, air defense and radar systems	1989
Ships	1988

The military quickly faced problems that it has not faced before: shortages of supplies, munitions, spare parts and even provisions. The difficulties can be avoided to an extent with the efforts of the national defense industry, but this industry is depressed like the national economy. Furthermore, the army budget allocations are insufficient and affect the commanders' ability to drill and train soldiers for joint military operations. The army budget dynamics of the past few years indicate the difficulties that the army confronts.

One of the most complicated problems that the country faces is how to guarantee national security in the period in which Bulgaria is not a member of NATO and will have to ensure its own self-defense. Under the Warsaw Treaty during the last four decades, Bulgaria did not train staff to plan for guaranteeing national security. Infrastructure, backing up the probable lines of possible military operations, the choice of equipment, drilling and training the armed forces—all this was subordinated to goals, tasks, and values outside the range of Bulgaria's national goals. The dramatically changing situation poses

difficult questions in either of the listed fields and these fields do not cover the entire range.

Today, the Republic of Bulgaria stresses its balanced foreign policy, internationally, in Europe, and particularly in the Balkan region, as a key factor of its national security. Domestically, the country is seeking to solve the national security problem within available ways and means. The Government is making every effort to gradually cut the drastic shortage of means in the military, to organize the police force in the anti-crime and anti-corruption drive, to establish the new forms of planning and management of the country's mobilization resources and potentials in line with the changes.

The Government of the United Democratic Forces that took office after the early elections on April 19, 1997 is trying to efficiently centralize power, including national security. Along with that revision, cooperation between the institutions of power in the field of national security will have to be expanded. Naturally, the National Assembly will adopt a greater number of rearmament and reform programs in all armed forces.

Despite the difficulties during the last years, Bulgaria is treading the democratic path. These years were particularly hard for the national security staff. During these years, the efforts to guarantee national security were increasingly harmonized, the perspective became clearer, the difficulties were easier to understand and the way to overcome these difficulties became more comprehensible. During the last couple of years, Bulgaria gained reputation as a stabilizing political factor in the Balkans. This is an important prerequisite for country's national security.

B. WELFARE AND SECURITY

1. Introduction

Balkan security is critical for guaranteeing an acceptable level of economic welfare, human freedoms and stable peace for the states in this subregion and for the whole of Europe. Under the new strategic conditions, security means more than territory and sovereignty. Economic security and welfare and the protection of civil rights begin to dominate subregional security. More and more often we also add to the latter the problems of national and transnational security. These three factors form the foundations of the stable regional development concept.

The Balkan security is strongly influenced by the general "world order" model. Regional confrontations forestall or are behind the changes in the global security system.

Economics analyzes the ways to allocate scarce resources between competing social needs. Defense economics faces the alternatives of **welfare** and **security**. When it calls for defense resources, defense economics considers the arrangement of the priorities of defense and welfare. Defense resources, excessive and incompatible with reality, not only set limits to welfare, but they also raise fears in neighbor states. On the other hand, under allocating resources for defense may improve welfare, but they could create an illusion that the country is of little importance and that its opponents could act with impunity. Thus, incompetent and inept management of defense resources can have significant complications, not only for internal welfare but also for external security. Defense resource management is more important when economies are reforming and changing their models for guaranteeing security. In this case, the expected effects from the changes might be compromised by poorly managed social resources.

2. NATO enlargement on The Balkan Peninsula

At the summit in Madrid last July, NATO's 16 heads of state and government invited three states from among the new democracies of Central and Eastern Europe to start accession talks to join the Alliance. The enlargement of NATO is part of a broad, long-term strategy that supports the evolution of a peaceful, undivided and democratic Europe.

a) Benefits of NATO enlargement

NATO enlargement generates both immediate and long-term benefits, and they accrue not only to existing and prospective NATO allies but also to states that at least initially will remain outside the Alliance. Europe is a more secure and stable region because of NATO's commitment to welcome new members. Facing an opportunity to become new members of NATO, part of the Balkan states are reconstructing their foreign and defense policies to bring them into line with Alliance values and norms. While there are many reasons for pursuing democratic reform, market development, security cooperation and other favorable goals, a close analysis of recent events in the region reveals that the process of NATO enlargement is exerting a positive influence in moving states in this region toward democracy. As states are admitted to the Alliance, the United States and Europe will reap even more substantial **benefits**:

• **Democratic reforms and stability**. The dominant pattern in central and Eastern Europe (CEU) is toward consolidating democratic, market, and security reforms. Support for NATO and its enlargement has become a unifying point among divergent political parties in many of these states and has helped to marginalize extreme factors. Inclusion in the Alliance will place new members within a community of security and strong political norms that will provide both the structure and incentive to consolidate their democratic advances.

• **Stronger collective defense and ability to address new security challenges**. Collective defense remains imperative for European and transatlantic security.

The dissolution of the Warsaw Pact eliminated the primary threat that NATO addressed during the Cold War. However, the war in the former Yugoslavia demonstrates that threats remain that affect the Balkan's security. Admitting new states to the Alliance will create a larger circle of like-minded nations committed to defending each other from these and other threats and to working together to build a more stable Europe.

- **Improved relations among the states on the Balkan Peninsula**. Growing cooperation with NATO and the desire to join the Alliance have provided a powerful impetus for resolving past disputes among Balkan' states. A series of agreements among these states and between these states and individual NATO allies were concluded in recent years, which will help to stabilize borders, promote inter-state cooperation and address mutual concerns on the treatment of ethnic minorities.

- **Burden sharing and contributions to NATO missions**. NATO membership will better enable the new allies to restructure their armed forces so that they can participate in the full spectrum of current and new Alliance missions, including Article V missions. Some new members will develop forces for a full range of Alliance missions and will become net "producers" of security. All will contribute funds to NATO's common budget. In short, new NATO members will make the same kinds of contributions to protecting shared US and European interests made by current NATO members.

- **Broader European stability**. Historically, when the security status of the Balkan Peninsula has been left unclear, the resulting uncertainty has exerted a strong and dangerously destabilizing influence for the whole of Europe. By fostering stability and confidence, NATO enlargement will advance the longer-term security interests not only of these states but also of the United States, Western Europe, CEU, Russia, and others throughout the region.

- **Prosperity**. As NATO enlargement helps resolve uncertainties about the Balkan states' place in an integrated Europe, it will also foster a more stable climate for economic reform, trade, and investment.

b) Costs of peace and security

Enlargement requires the existing NATO members to extend the most solemn security guarantees to the new allies. The next paragraphs describe the financial costs associated with the new security commitments that will be extended to the new member states.

- Article V of the North Atlantic Treaty of 1949 requires all members to treat an attack on one as an attack on all. The enlargement will require the allies to assume a readiness to assist these states should events require such a response. Indeed, the credibility of the security guarantees NATO extends to these states will depend on the demonstrated capacity of the allies to fulfill them.
- NATO enlargement will ultimately enhance Russia's security by fostering democratic reform and stability in CEU. Even so, a substantial portion of Russia's leaders oppose enlargement, especially on the Balkans, based on a misperception that it will be detrimental to Russia's security and position in Europe. The Allies are committed to forging a long-term strategic partnership with a democratic Russia and to providing ways for Russia to be a full and constructive participant in Europe's new security system.
- Some observers argue that Balkan states not immediately admitted to NATO will suffer a sense of isolation and vulnerability, which might undermine democratic reforms and pro-Western sentiment. NATO, however, has committed itself to an open-door policy, is enhancing cooperation with all the new democracies through the Partnership for Peace and is developing the Atlantic Partnership Council to ensure that enlargement also enhances security for those not initially admitted. The vast majority of states in the region favor enlargement and see it as contributing to their overall security.
- Some observers also express concern that membership in NATO will require Balkan states to devote additional resources to their militaries at a time when their needs are primarily economic and social. While it is certainly true that new member states will be required to invest in their militaries, improve their capabilities and bear their share of Alliance responsibilities, NATO membership will also enable them to further downsize

their forces without diminished security. Thus it is highly questionable whether in the long term their resulting security costs will be higher than they would have been had NATO not expanded. Indeed, it is likely that if NATO did not enlarge, there would be more instability on Balkans and thus higher security costs for states in the region.

- NATO makes its decisions by consensus among its members. Some observers have suggested that increasing the Alliance beyond its current 16+3 members will make it harder to reach internal consensus and make timely and coherent decisions. While it is true that consensus building could require more effort, this activity should be viewed in its proper context. Nations within NATO that have differences of view have both a proven forum and an incentive to resolve problems, whereas bilateral Balkan disputes can linger for many years.

C. UTILITY FUNCTION OF A COUNTRY

1. National defense and utility function

National defense is a typical case of a public good; if it is provided for a single member of the society, it is provided for all members of the society. This public good is provided by the government and is paid by the general revenue system. The price of this service is not determined in a market; it is difficult to evaluate the economic benefits of national defense.

Defense spending takes in a substantial share of a country's national output. Despite the downward trend in the world during the last years, the amount of military expenditures remains a significant percentage of total output. The levels of defense spending have a powerful influence on all sectors of the society.

The purpose of national defense expenditures is to support a nation in achieving its national security objectives. These objectives, however, are affected by other nations' defense expenditures. Changes in the military efforts by both country's allies and adversaries will result in changes of military expenditures of the country.

2. Utility function of an individual country

We can present a particular country as a utility maximizer, where utility is given by the function [10]:

$$Ui = U(Xi, Yi), \tag{2.1}$$

where: Xi presents the country i's consumption of non-defense goods,
Yi presents the country i's consumption of defense goods.

Country i has a so-called budget constraint expressed as:

$$Gi = Pi\,Xi + Yi, \tag{2.2}$$

where: Gi denotes country i's Gross National Product (GNP)
Pi is the price of the private goods relative to the defense goods.

For more detailed description we can present the utility function of country i as [10]:

$$U_i = (X_i - S_i)^{a_i} (Y_i - T_i)^{b_i}, \tag{2.3}$$

where: Si measures subsistence or minimum requirements for non-defense goods of country i,
Ti measures the minimum defense requirements of country i,
ai and bi represent country i's utility elasticity of non-defense and defense goods, respectively.

This model doesn't directly measure national security, but the utility function indirectly indicates the welfare effects of national security. This utility function (2.3) includes the country's threat perception and indicates how it evaluates defense versus nondefense goods.

3. Multi-country model

When we consider a multi-country model (defense alliance) we should mention that each country benefits from its allies' military expenditures. In this case we will substitute country i's consumption of defense goods Yi with its total consumption of defense goods Zi [10].

$$Z_i = Y_i + \sum_{j \neq i} E_{ij} Y_j = Y_i + Z_{-i}, \qquad (2.4)$$

where: Eij represents the commitment to the defense of country i from country j.

In the relationship between these two countries (i and j) country i perceives that only a portion of the military expenditures Yj of the second country is relevant to country i's defense. Generally, $0 \leq Eij \leq 1$.

When Eij = 0, country j's defense expenditures are purely private. Country i perceives no commitment to its defense efforts from country j. The defense calculations of the first country don't depend on the assistance from the second country. This situation corresponds to the case of an individual country from subsection 1.

When Eij =1, country j's defense expenditures are purely public, i.e., they are completely devoted to the alliance.

In a real situation, when $0 \leq Eij \leq 1$, the utility function of country i is presented as follows:

$$U_i = (X_i - S_i)^{a_i} (Z_i - T_i)^{b_i}, \qquad (2.5)$$

In the common case the total consumption of defense goods Zi is bigger than the consumption of defense goods Yi. Assuming this and comparing formulas (2.3) and (2.5) our first conclusion is that the utility function of country i increases if it is included in an alliance with its current adversaries.

D. GNP AND MILITARY EXPENDITURES OF THE BALKAN COUNTRIES

1. GNP and population growth

a) GNP of the countries

GNP for different countries is a useful measure for the so-called budget constraints. However, a methodological problem arises when attempting to convert the GNP of several different countries into a single currency. The problem is that a significant

part of GNP is made up of nontraded goods and services, that is, goods that do not and often cannot enter into international trade. Gross national product converted to dollars by exchange rates that are determined by the flow of traded goods alone will give misleading comparisons if the ratio of prices of nontraded goods to the prices of traded goods is different in the countries being compared. To avoid this problem, we will use the exchange rate that is calculated by comparing the prices in two countries of nontraded as well as traded goods; this is called the purchasing power parity (PPP).

For the purpose of the analysis in Chapter 3, Table 2.1 (Appendix A) and Figure 2.1 present GNP data for a number of Balkan countries [12]. The scope of this presentation will be limited to Bulgaria and its neighbors. Only Macedonia is not presented, because of its relative insignificance in terms of population, GNP, and armed forces.

According to the changes in GNP during the period 1985—1995 we can divide the countries into three groups. The first group, Greece and Turkey, show uninterrupted increase in GNP during the last 11 years. The second group, Bulgaria and Romania, have a substantial drop in GNP between 1989 and 1993, and relative stabilization after 1993. The deterioration of the economic performance of these countries in the early 1990's is connected with the dissolution of the former East European economic organization COMECOM. The third group is presented by only one country, Yugoslavia, whose unusual drop of GNP in 1991 and 1992 is a consequence of the civil war and disintegration of the country.

b) Population of the countries

The Population of Bulgaria and most of its neighbors between 1985 and 1995 is presented in Table 2.2 (Appendix A) and in Figure 2.2. The population of Bulgaria and Romania is decreasing at a very slow pace, the population of Greece is increasing somewhat, and there is a big drop in the population of disintegrated Yugoslavia. The only country that has a substantial natural increase in population is Turkey.

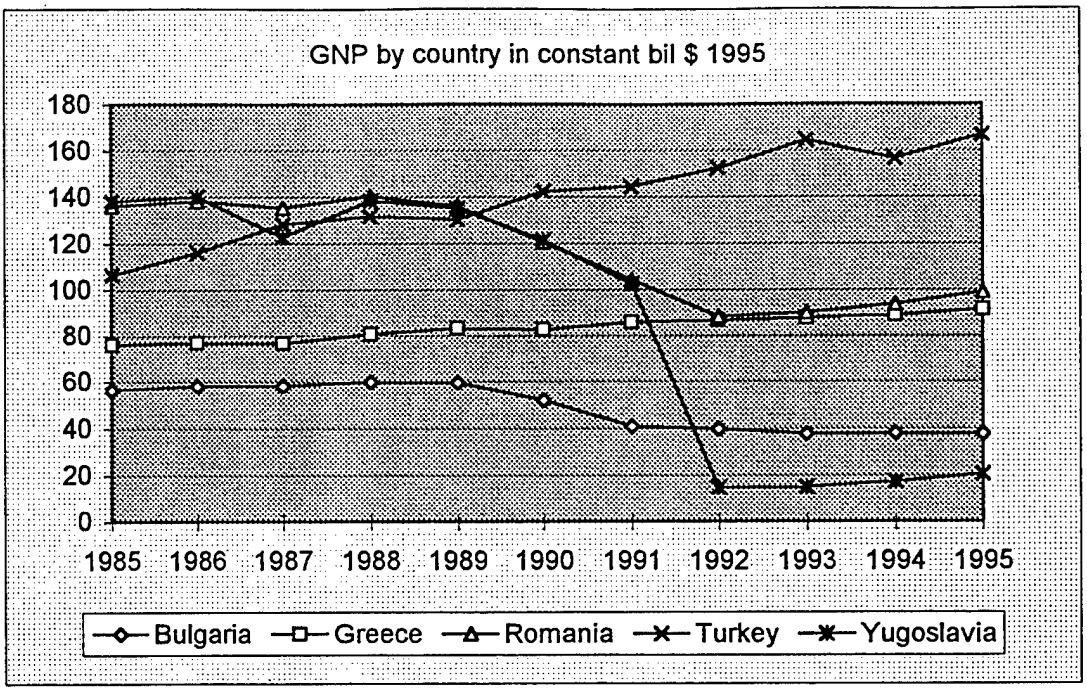

Figure 2.1. Gross National Product by country

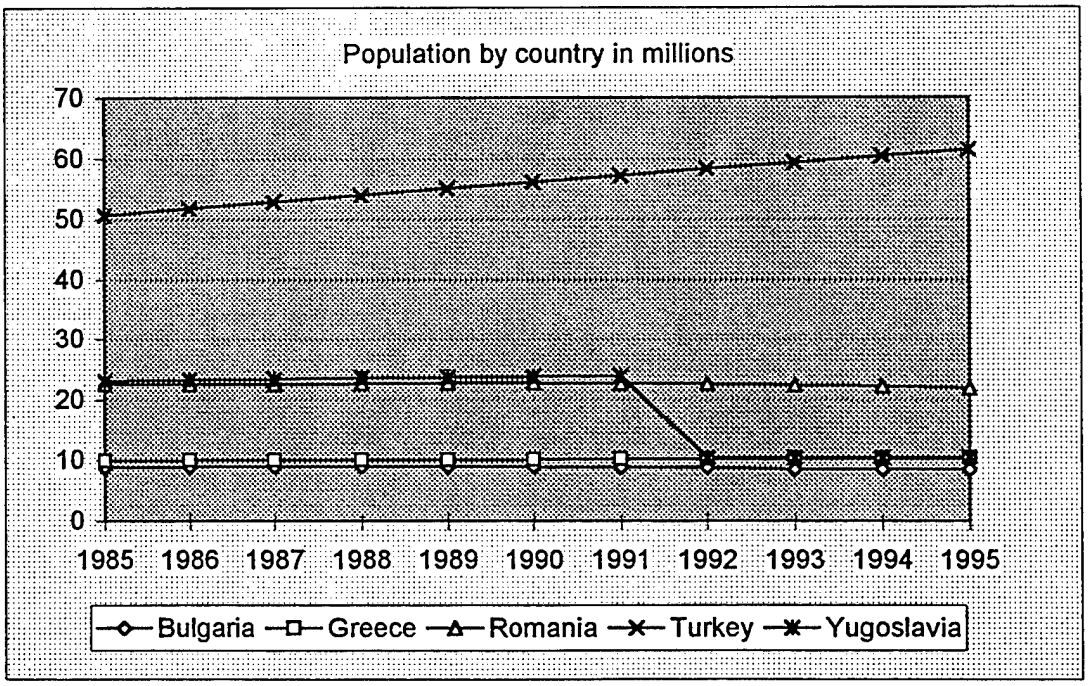

Figure 2.2. Population by country

c) GNP per capita of the Balkan countries

It is useful to present not only the GNP of the Balkan countries, but also their GNP per capita. These data can be seen in Table 2.3 (Appendix A) and in Figure 2.3. Greece has the highest and Turkey has the lowest GNP per capita, but both of them show a steady increase of this parameter between 1985 and 1995. In the beginning of the period, Bulgaria and Romania had relatively high figures, a substantial drop after the collapse of COMECOM, and relative stabilization or slight increase at the end of the period. Yugoslavia's data again reflects their grave crisis—the consequence of civil war and disintegration.

2. Military expenditures

a) Military expenditures of the countries

The Balkan countries' military expenditures [12] in billions of constant 1995 dollars are presented in Table 2.4 (Appendix A) and Figure 2.4. The downward trend in military spending of Bulgaria and Romania (the most militarized Balkan countries in the 1980's) starts in 1987 and continues until 1993. After this year we see some increase in their military spending. Data for Yugoslavia are not complete. Greek military spending is relatively stable, while the military expenditures of Turkey show steady growth.

b) Military expenditures as a percent of GNP

Table 2.5 (Appendix A) and Figure 2.5 show military expenditures as a percent of GNP for Bulgaria and its neighbors between 1985 and 1995. The percent of military expenditures in Turkey is almost constant during these years (around 4%), while the Greek percentage shows some decline (from 7% in 1985 to 5.5% in 1995). In 1995, however, both countries spend a much higher percentage of GNP for military resources than the average for world (2.8%) or the average for NATO (3.0%). One of the reasons

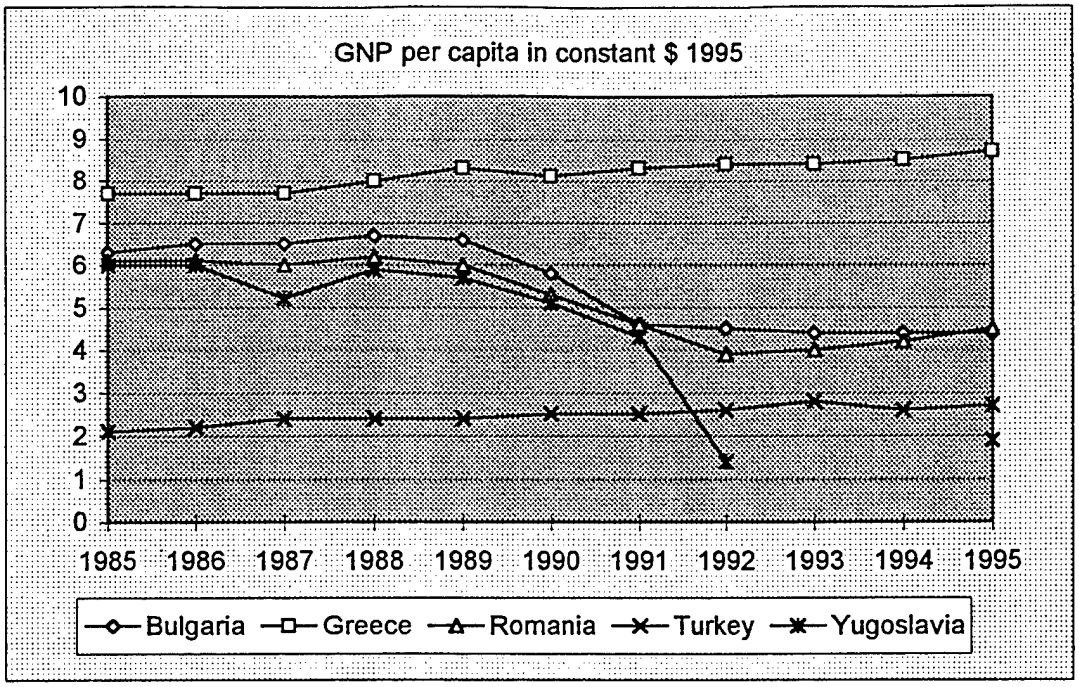

Figure 2.3. Gross National Product per capita

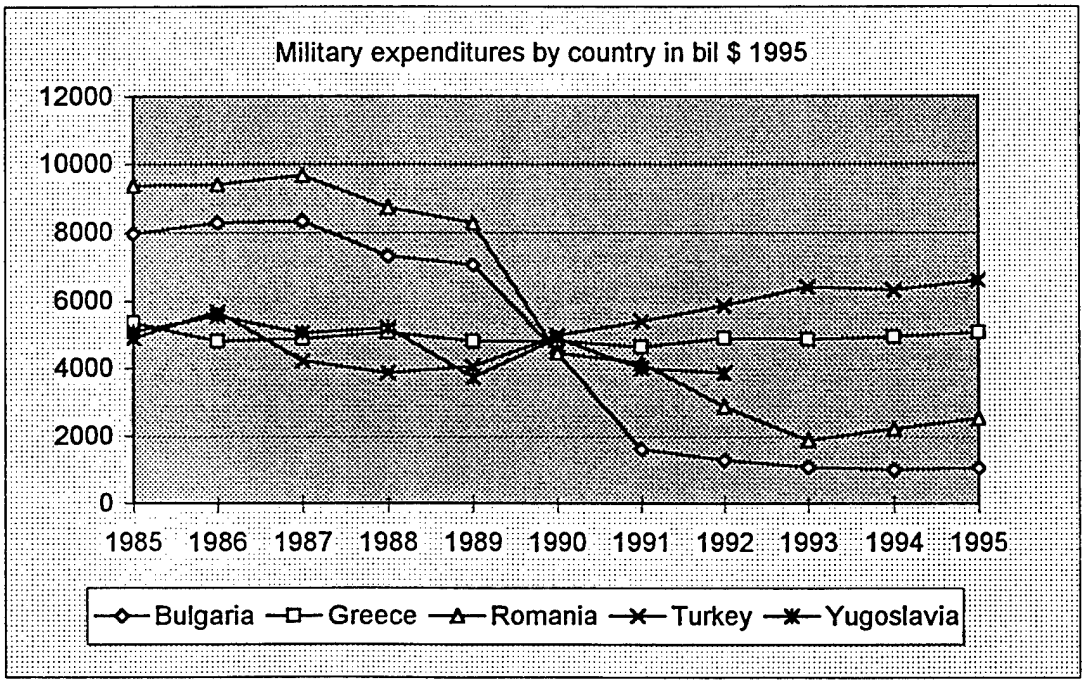

Figure 2.4. Military expenditures by country

for these countries' substantial military expenditures is the hostility between them, which has deep historical roots.

In 1985, Romania's military spending as a percent of GNP is equal to that of Greece; after a decrease in this index in 1995, it has the smallest ratio among the five countries. After years of considerable military efforts (more than 14% of its GNP), in the 1990's Bulgaria's ratio decreased dramatically; in 1995 its military expenditures relative to GNP (2.8%) equaled the average for the world.

c) Military expenditures per capita

It is interesting to see military expenditures of the Balkan countries per capita. The results are presented in Table 2.6 (in Appendix A) and in Figure 2.6. The picture shows almost constant expenditures for Turkey and Greece, but the Turkey's military spending per capita is below the world's average (approximately $152 in 1995), while Greek expenditures are more than three times higher. In the 1980's Bulgaria and Romania were in first and third positions on the Balkan Peninsula according to their military spending per capita; in 1995 their expenditures equaled those of Turkey and were below the world average.

3. Armed forces of the Balkan countries

a) Armed forces by country

The downward trend of the world and NATO armed forces between 1985 and 1995 doesn't significantly affect the data for the Balkan countries [12]. The only country in this sub-region that substantially decreased the number of soldiers is Bulgaria. The data are presented in Table 2.7 (Appendix A) and in Figure 2.7. Romania and Turkey maintain almost the same number of soldiers during these years, while Greece increased its military strength.

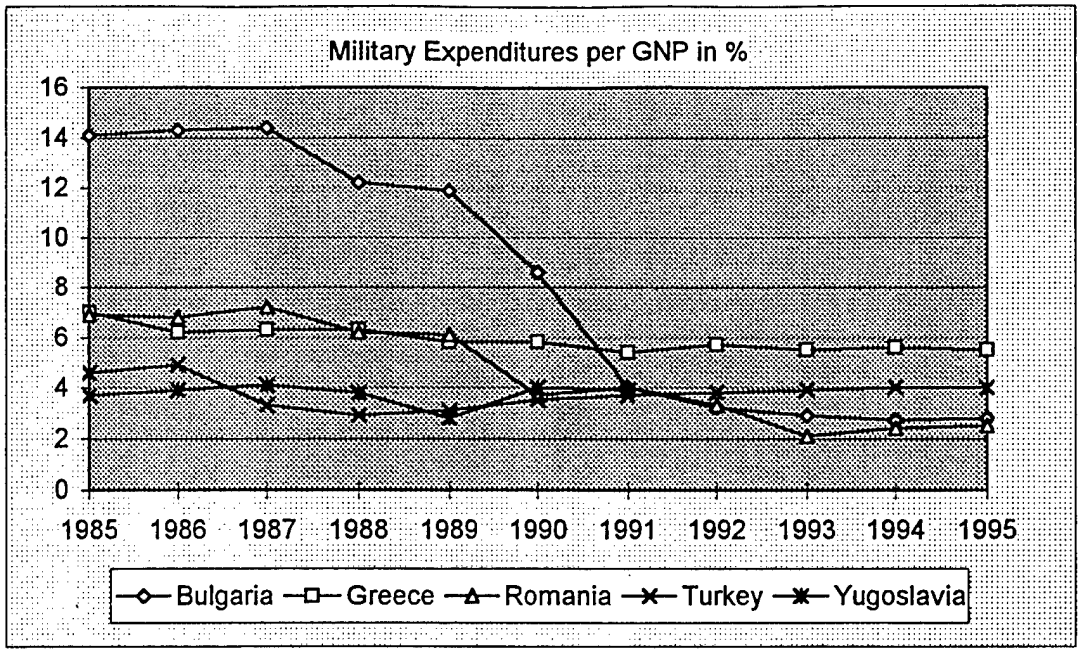

Figure 2.5. Military expenditures per GNP by country

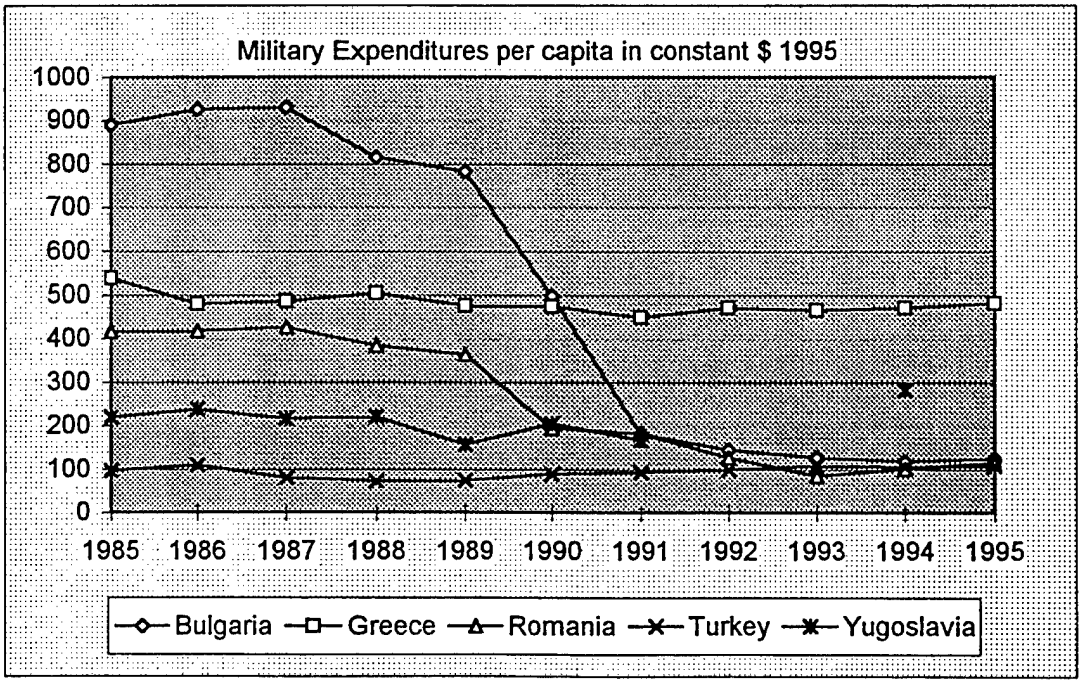

Figure 2.6. Military expenditures per capita

It is interesting to note that the number of Turkish soldiers is four times higher than the number of soldiers from its NATO ally Greece, and still higher than the cumulative number of soldiers from Bulgaria, Greece, and Romania.

b) Armed forces per 1,000 people

Data presented in Table 2.8 (Appendix A) and in Figure 2.8 show a somewhat different picture. When we examine the number of soldiers per 1,000 people, the leader among Bulgaria's neighbors is Greece, which ranks first with a stable index of 20. In contrast, the average for world in 1995 was 4 and the average for NATO was 6.7. Bulgaria had the highest ratio in the region with 21 soldiers per 1,000 people in mid 80's; in 1995 Bulgaria had an index of 10. A similar downward trend characterizes the indices of Romania and Turkey. Nevertheless, the Balkan Peninsula remains a highly militarized region of Europe and the World.

4. Arms transfers

a) Arms imports

The data for arms imports are presented in Table 2.9 (Appendix A) and in Figure 2.9. The world arms trade declined generally during the last ten years, but this tendency is not shown clearly on the Balkan Peninsula [12]. After being the biggest importer of arms in mid 80's, Bulgaria had no imports at the end of the period. The same situation holds for Romania. During the same period, the arms imports in Greece and Turkey were relatively constant. This level is much more a characteristic of the Cold War years than the end of the Twentieth century.

b) Arms exports

Table 2.10 (Appendix A) and Figure 2.10 show the data for arms exports in millions of constant 1995 dollars during the same 11-year period. Greece and Turkey have never been big arms exporters and they maintained low exports during these years.

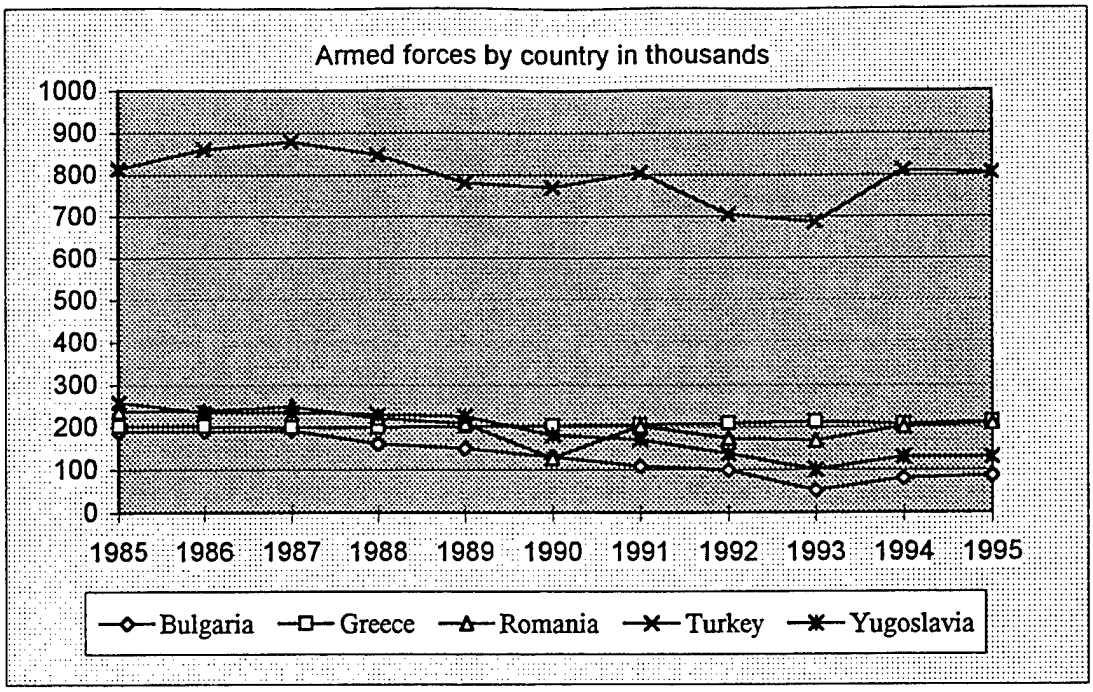

Figure 2.7. Armed forces by country

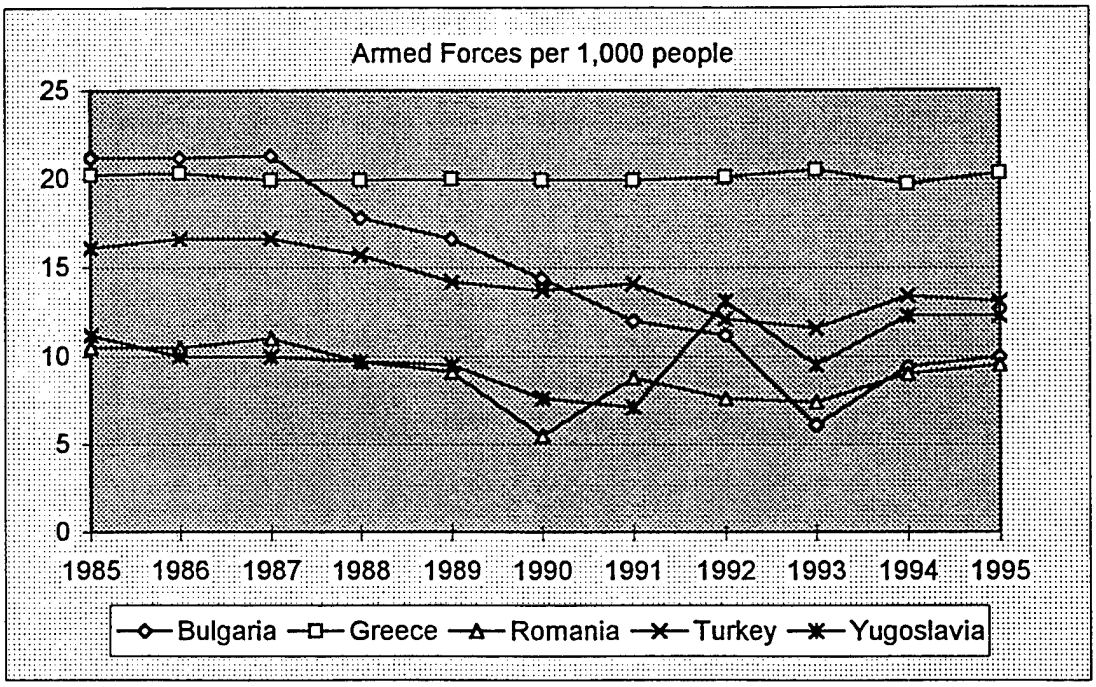

Figure 2.8. Armed forces per 1,000 people

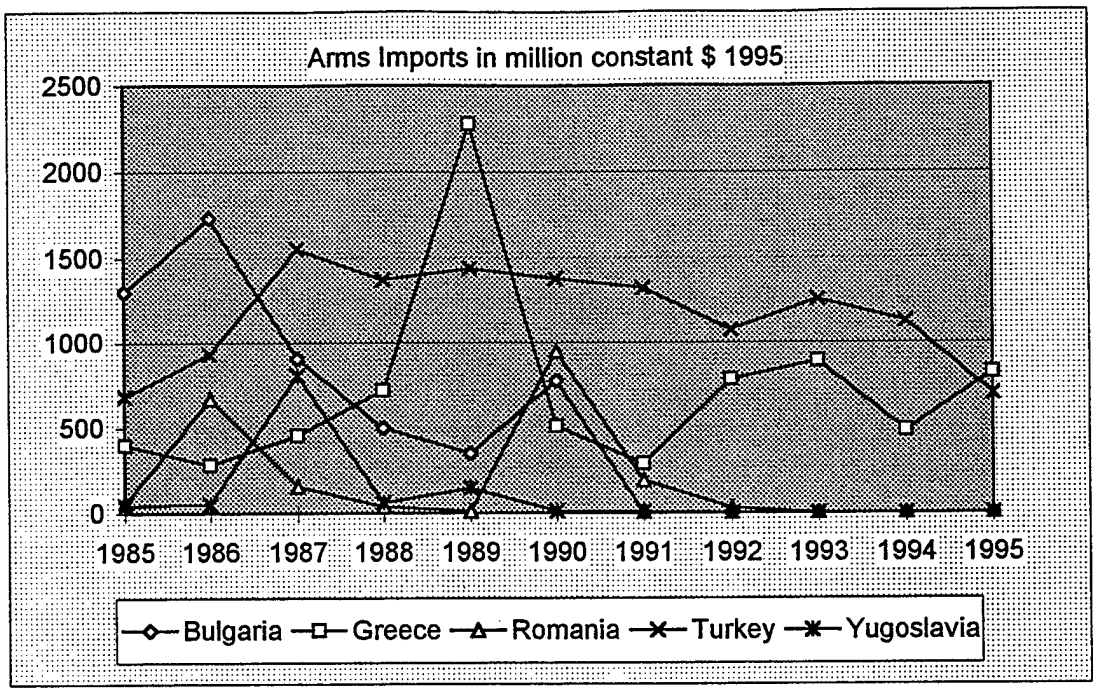

Figure 2.9. Arms imports by country

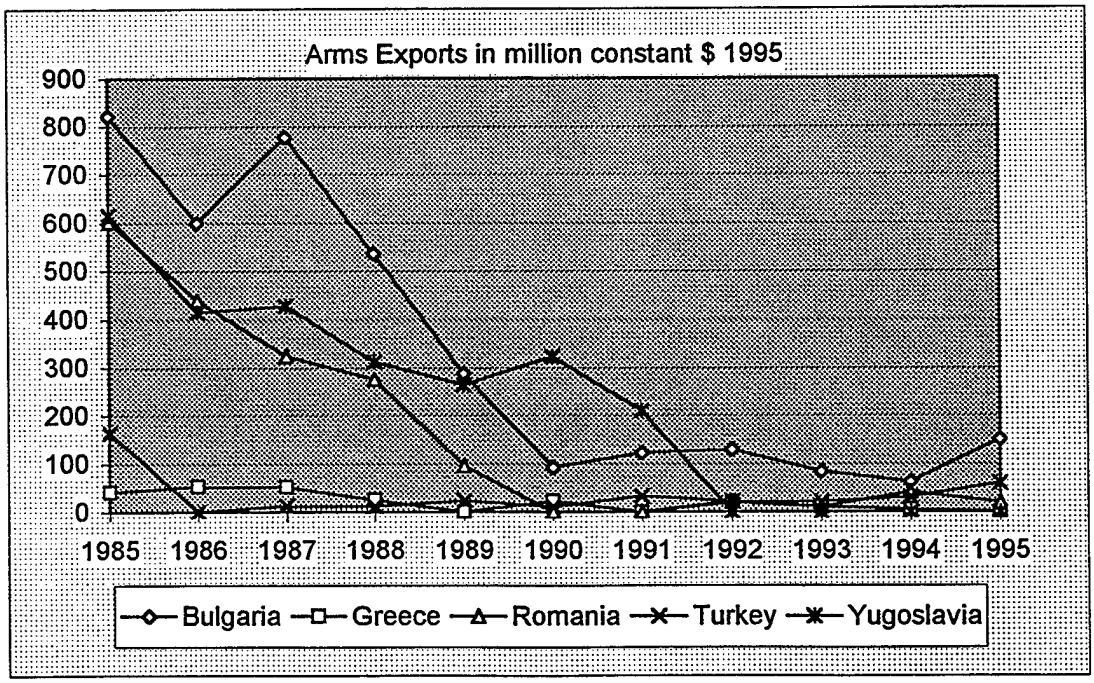

Figure 2.10. Arms exports by country

On the other hand, the biggest exporter of arms in mid 80's on the Balkan Peninsula, Bulgaria shows a steady downward trend. It is valid also for the second and third biggest exporters—Yugoslavia and Romania. Despite this trend in 90's, Bulgaria remains the number one arms exporter among the Balkan countries.

III. SIMULATION OF THE MODEL FOR COMMON SECURITY

A. A MODEL OF NATO ENLARGEMENT ON THE BALKANS

1. NATO and the countries on the Balkan Peninsula

To address the issues raised in the previous chapters, it is useful to create a mathematical model which depicts the benefits and costs of including more Balkan states in the system for common security. This system reflects one possible future scenario for NATO enlargement on the Balkan Peninsula. The benefits and costs will be evaluated in terms of **Level of security** and **Social Welfare** of the Balkan states.

Figure 3.1 shows the ten Balkan Peninsula countries: Albania (AL), Bosnia and Herzegovina (BH), Bulgaria (BU), Croatia (CR), Greece (GR), Macedonia (MA), Romania (RO), Slovenia (SL), Turkey (TU), and Yugoslavia (YU).

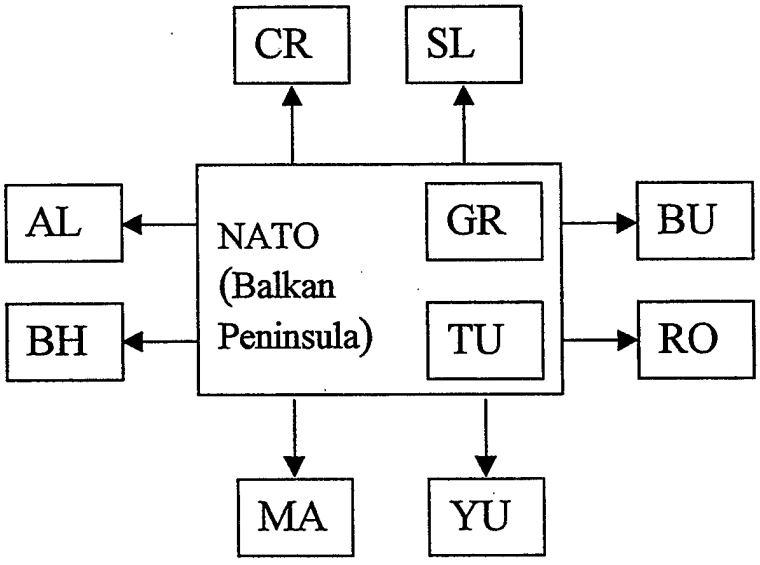

Figure 3.1. Countries on the Balkan Peninsula

Two of these countries (Greece and Turkey) are members of NATO; most of the remaining countries want to join them in the Alliance. Among the all of the candidates, Romania and Bulgaria have the best chances to join NATO during the next five years. We expect all of the countries to benefit from future NATO enlargement. The level of benefit, however, will vary among different countries and depend on the level of security provided by the new system for common security on The Balkans.

2. Different Scenarios of integration

There are six different scenarios for Bulgaria's integration in the existing system for common security—NATO. Despite the well-known animosity between the NATO representatives from the Balkans, it is convenient to consider Greece and Turkey as an integral part of the Alliance presenting its assets in this sub-region. For Bulgaria, concluding an agreement with NATO equates to making an alliance with the local representatives of this organization. Examining the potential gains from cooperation, we can consider six scenarios for integration:

a) Bulgaria and Greece

In this case we consider a situation where Bulgaria's neighbor, Greece, separates from its current condition, membership in NATO, and forms an alliance with Bulgaria. This situation is improbable, but we can use the results for comparison purposes.

b) Bulgaria and Turkey

This case is similar to situation **(a)**. There is also very low probability that Turkey will leave NATO and create an alliance with Bulgaria, however we will use the results for comparison.

c) Bulgaria and NATO

In this case we will examine the situation in which Bulgaria is the only new member of NATO, among the all aspirants. The data for the whole NATO organization will be substituted by the data for its representatives on the Balkans: Greece and Turkey.

d) Bulgaria and (NATO and Romania)

In this scenario we assume that Romania is the first country from the Balkans that becomes a member of NATO. After integrating Romania in the Alliance, Bulgaria has the opportunity to join the new Alliance, already including three Balkan countries: Greece, Romania, and Turkey.

e) Bulgaria and Romania and NATO

In this scenario, Bulgaria and Romania simultaneously become members of the Alliance.

f) (Bulgaria and Romania) and NATO

In this situation, Bulgaria and Romania form a bilateral military alliance before joining NATO. The probability for this scenario is very low because it means that these countries would revitalize their military cooperation from the dissolved Warsaw Pact.

Considering the political situation on the Balkans and in Europe as a whole (presented in the previous sections), the most probable scenarios for Bulgaria's integration into a common security alliance are: **(c)** , **(d)** , and **(e)**

B. ISOLATION CASE VERSUS NASH CASE

1. Isolation case

In Chapter II, section C we defined the utility function and budget constraints of the individual country i in the following way:

$$U_i = (X_i - S_i)^{a_i} (Y_i - T_i)^{b_i} \tag{3.1}$$

$$G_i = P_i X_i + Y_i \tag{3.2}$$

This country has no allies, its military expenditure provide purely private goods, and it doesn't benefit from any other country's defense expenditures. Having this type of utility function and budget constraint, it is easy to derive an expression for country i's isolation defense expenditures:

$$Y_i = \frac{b_i(G_i - S_i P_i) + a_i T_i}{a_i + b_i} \tag{3.3}$$

The expression for this country's non-defense goods will be:

$$X_i = \frac{a_i(G_i - T_i) + b_i S_i P_i}{(a_i + b_i) P_i} \tag{3.4}$$

In formulas (3.3) and (3.4), military and non-defense expenditures depend on different variables and constants. It is the same for the utility function in (3.1). Changing the value of some of these variables we can calculate different values for utility and defense expenditures of the country and make observations.

2. Nash case

In order to calculate the defense expenditures of country i, which joins a defense alliance, we will use a different expression for the utility function [10]:

$$U_i = (X_i - S_i)^{a_i} (Z_i - T_i)^{b_i} \tag{3.4}$$

As mentioned in Chapter 2, Section C, country i's total consumption of defense goods Zi is:

$$Z_i = Y_i + \sum_{j \neq i} E_{ij} Y_j = Y_i + Z_{-i} \tag{3.5}$$

We will assume two situations: the first involves a defense alliance including two allies; the second involves a defense alliance consisting of three allies.

a) Defense alliance with two allies

In this case, the Nash defense expenditure reaction function is given by:

$$Y_i^N = \frac{b_i(G_i - S_iP_i) + a_i(T_i - Z_{-i})}{a_i + b_i} = Y_i - \gamma_i Z_{-i}, \qquad (3.6)$$

where: $\gamma_i = \frac{a_i}{a_i + b_i} < 1$

In equation (3.6), Yi represents country i's isolation defense expenditures and γi is the slope of the reaction function. Nash equilibrium occurs when the reaction curves of the two members of the alliance intersect. The intersection is the point where country i's expectations regarding the country j's contribution are consistent with the second country's actual contribution, and vise versa [10].

For an alliance involving two countries, simultaneously solving both countries' reaction functions yields the following expression for Nash equilibrium defense expenditures [10]:

$$Y_i^N = \frac{b_i(a_j + b_j)(G_i - S_iP_i) - a_ib_jE_{ij}(G_j - S_jP_j) + a_i(a_j + b_j)T_i - a_ia_jE_{ij}T_j}{(a_i + b_i)(a_j + b_j) - a_ia_jE_{ij}E_{ji}} \qquad (3.7)$$

Considering that countries i and j have GNP's and threat perceptions that change during the time, it is possible to derive the trend for the military expenditures and for the nations' utility level.

b) Defense alliance with three allies

With a defense alliance consisting of three allies, we can write the countries' utility functions as follows:

$$U_1 = U_1(X_1, Z_1) = (X_1 - S_1)^{a_1}(Z_1 - T_1)^{b_1} \qquad (3.8)$$

$$U_2 = U_2(X_2, Z_2) = (X_2 - S_2)^{a_2}(Z_2 - T_2)^{b_2} \qquad (3.9)$$

$$U_3 = U_3(X_3, Z_3) = (X_3 - S_3)^{a_3}(Z_3 - T_3)^{b_3} \qquad (3.10)$$

The countries' budget constraints are:

$$G_1 = P_1X_1 + Y_1 \qquad (3.11)$$

$$G_2 = P_2X_2 + Y_2 \qquad (3.12)$$

$$G_3 = P_3X_3 + Y_3 \qquad (3.13)$$

Using formula (3.5) we can present each country's total consumption of defense goods as:

$$Z_1 = Y_1 + E_{12}Y_2 + E_{13}Y_3 \tag{3.14}$$

$$Z_2 = Y_2 + E_{21}Y_1 + E_{23}Y_3 \tag{3.15}$$

$$Z_3 = Y_3 + E_{31}Y_1 + E_{32}Y_2 \tag{3.16}$$

If we substitute equations (3.8) to (3.16) into equation (3.6) we will find expressions for the three countries' Nash expenditure reaction functions are:

$$Y_1^N = Y_1 - c_1E_{12}Y_2^N - c_1E_{13}Y_3^N \tag{3.17}$$

$$Y_2^N = Y_2 - c_2E_{21}Y_1^N - c_2E_{23}Y_3^N \tag{3.18}$$

$$Y_3^N = Y_3 - c_3E_{31}Y_1^N - c_3E_{32}Y_2^N, \tag{3.19}$$

where: $c_i = \dfrac{a_i}{a_i + b_i}$

We can transform equations (3.17) – (3.19) in the following way:

$$Y_1 = Y_1^N + c_1E_{12}Y_2^N + c_1E_{13}Y_3^N \tag{3.20}$$

$$Y_2 = c_2E_{21}Y_1^N + Y_2^N + c_2E_{23}Y_3^N \tag{3.21}$$

$$Y_3 = c_3E_{31}Y_1^N + c_3E_{32}Y_2^N + Y_3^N \tag{3.22}$$

Equations (3.20-22) can be presented by a matrix multiplication:

$$\mathbf{Y} = \mathbf{A}\,\mathbf{Y}^{\mathbf{N}}, \tag{3.23}$$

where: $\mathbf{Y} = \begin{vmatrix} Y_1 \\ Y_2 \\ Y_3 \end{vmatrix}$ is a vector of the countries' military expenditures,

$\mathbf{Y}^{\mathbf{N}} = \begin{vmatrix} Y_1^N \\ Y_2^N \\ Y_3^N \end{vmatrix}$ is a vector of their Nash defense expenditures,

$\mathbf{A} = \begin{vmatrix} 1 & c_1E_{12} & c_1E_{13} \\ c_2E_{21} & 1 & c_2E_{23} \\ c_3E_{31} & c_3E_{32} & 1 \end{vmatrix}$ is a matrix of their interdependencies.

Our task is to find the countries' Nash defense expenditures Y_i^N . It is easy to solve this problem by transforming equation (3.23) as follows:

$$\mathbf{Y}^{\mathbf{N}} = Inv(\mathbf{A})\,\mathbf{Y} \qquad (3.24)$$

When we compare the defense expenditures for both cases, isolation and alliance, from equations (3.7) and (3.17) we hypothesize that country i reduces its military expenditures in the alliance case. Simultaneously, our hypothetical country increases its non-defense expenditures and its utility level. These adjustments are responses to the perceived value of the allied defense inflow, Z-i. These results depend on the relative utility elasticities of the defense and non-defense goods, ai and bi . As a result, country i reduces its military expenditures by a smaller amount than the increase in the perceived allied contribution (the actual response depends on coefficient γi). In this way, according to equation (3.5), country i's total defense consumption increases. Since this increase is accompanied with an increase of the non-defense expenditures, the utility of country i increases also.

C. SCENARIOS WITH TWO ALLIES

To illustrate the above considerations, we will show some numerical results. For this purpose we will use a stylized representation of the Balkan Peninsula. We will assume that all of the countries are identical in their structure—coefficients ai, bi, and Pi. Of course, these countries are different in size, population, economic performance, and threat perception. We assume also that all of the countries on the Balkan Peninsula have the same relative minimum non-defense consumption requirements (i.e., Si=25% of GNP).

1. Bulgaria and Greece

The parameters of these two countries are shown in Table 3.1. Data for Bulgaria's and Greece's GNP (Gi) are from Table 2.1 (Appendix A). They are given in billions of constant 1995 dollars. These data are averaged over the last eleven years (from 1985 to

1995). The perceived commitment Eij reflects the countries' relative geographic size and population.

Country	Gi	ai	bi	Pi	Si	Ti	Eij
Bulgaria	50	0.7	0.2	3	12.5	1.6	0.75
Greece	80	0.7	0.2	3	20	0.7	1

Table 3.1. Illustrative countries' parameters

Using the parameters from Table 3.1 and equations (3.1), (3.3), (3.4), and (3.6) we can calculate the defense expenditures (Y) and utility functions (U) of Bulgaria and Greece for both the isolation and alliance cases, assuming a Nash equilibrium. Table 3.2 shows the results of these calculations and also the percentage of change of the defense expenditures and utility function for each of the countries after forming an alliance.

Numerical results for Bulgaria's and Greece's defense expenditures in the isolation case in billions of constant 1995 dollars reflect the real situation with this level of threat perception. Comparing the data for defense expenditures from Table 3.2, shows that the estimated values are similar to the average defense expenditures for the both countries during the last eleven years (from Table 2.1, Appendix A).

Country		Y	$Y_{(N)}$	X	U	Y/G	$Y_{(N)}/G$	% ΔY	% ΔU
Bulgaria	Isolation	4.02		15.33	2.47	0.08			
	Nash		2.04	15.99	2.99		0.04	49 %	21 %
Greece	Isolation	4.99		25.00	4.13	0.06			
	Nash		3.41	25.53	4.52		0.04	32 %	9 %

Table 3.2. Illustrative isolation and Nash results

Table 3.2 shows that Bulgaria, despite its smaller size, bears a relatively heavy military burden in the isolation case. Bulgaria's higher relative defense expenditures reflect

its higher perceived threat. Table 3.2 shows also how the basic parameters for the both countries are changing after a concluding a bilateral alliance. A direct consequence of this alliance is a substantial drop in their military burden and increase in their utility level.

2. Bulgaria and Turkey

A Bulgaria/Turkey alliance would have similar results to those described in Subsection 1. Parameters for both countries are shown in Table 3.3. GNP data are also from Table 2.1 (Appendix A). In this case, the threat perception is different and the perceived commitment from Bulgaria's point of view is much smaller compared to the previous case. It reflects the huge difference in size and population between Bulgaria and Turkey.

Country	Gi	ai	bi	Pi	Si	Ti	Eij
Bulgaria	50	0.7	0.2	3	12.5	1.6	0.15
Turkey	140	0.7	0.2	3	35	1	1

Table 3.3. Illustrative countries' parameters

Nevertheless, numerical results from Table 3.4 show a drop in the military expenditures of both countries, and an increase of their utility level after concluding a bilateral agreement.

Country		Y	$Y_{(N)}$	X	U	Y/G	$Y_{(N)}/G$	% ΔY	% ΔU
Bulgaria	Isolation	4.02		15.33	2.47	0.08			
	Nash		3.33	15.56	2.65		0.07	17 %	7 %
Turkey	Isolation	8.56		43.81	6.88	0.06			
	Nash		5.97	44.68	7.48		0.04	30 %	9 %

Table 3.4. Illustrative isolation and Nash results

3. Bulgaria and NATO

In this scenario, Bulgaria is included in an alliance with Greece and Turkey—the NATO representatives on the Balkan Peninsula (NATO-BP). This situation is similar to that described in the previous two subsections. Parameters for both sides are shown in Table 3.5. Data for GNP are from Table 2.1 (Appendix A). The threat perception of the existing alliance (NATO-BP) is different. The perceived commitment from Bulgaria's point of view also reflects the substantial difference in size and population between Bulgaria and NATO-BP.

Country	Gi	ai	bi	Pi	Si	Ti	Eij
Bulgaria	50	0.7	0.2	3	12.5	1.6	0.12
NATO-BP	220	0.7	0.2	3	55	0.4	1

Table 3.5. Illustrative countries' parameters

Table 3.6 shows the results of including Bulgaria in an alliance with the part of NATO situated on the Balkan Peninsula. This alliance, as in the previous cases, is accompanied with a considerable drop in the military expenditures of all members and increases in their utility levels.

Country		Y	$Y_{(N)}$	X	U	Y/G	$Y_{(N)}/G$	% ΔY	% ΔU
Bulgaria	Isolation	4.02		15.33	2.47	0.08			
	Nash		3.08	15.64	2.72		0.06	24 %	10 %
NATO - BP	Isolation	12.53		69.16	10.53	0.06			
	Nash		10.14	69.95	11.06		0.05	19 %	5 %

Table 3.6. Illustrative isolation and Nash results

4. Bulgaria and (NATO + Romania)

This scenario illustrates the situation where Bulgaria is included in NATO's alliance on the Balkan Peninsula, but Romania has already been admitted as a member of NATO. The situation is somewhat difficult to assess, because some data in Table 3.5 would change as Romania is admitted to NATO. Bulgaria's threat perception should increase when the status quo on the Balkan Peninsula changes. An alliance between the countries surrounding Bulgaria from North and South inevitably would increase fears among Bulgarian politicians and its population.

Illustrative parameters for both sides in the new situation are shown in Table 3.7. Data for GNP, as in the previous cases, are from Table 2.1 (Appendix A). The perceived commitment from Bulgaria's point of view reflects the significant difference in size and population between Bulgaria and the new alliance—(NATO-BP + Romania).

Country	Gi	ai	bi	Pi	Si	Ti	Eij
Bulgaria	50	0.7	0.2	3	12.5	2	0.09
NATO+RO	335	0.7	0.2	3	83.75	0.4	1

Table 3.7. Illustrative countries' parameters

Table 3.8 shows the results of forming an alliance between Bulgaria and a NATO organization on the Balkans, which includes the current members of the Alliance plus

Country		Y	$Y_{(N)}$	X	U	Y/G	$Y_{(N)}/G$	% ΔY	% ΔU
Bulgaria	Isolation	4.33		15.22	2.39	0.09			
	Nash		3.18	15.61	2.69		0.06	27 %	13 %
NATO + Romania	Isolation	18.92		105.4	15.41	0.06			
	Nash		16.45	106.2	15.94		0.05	13 %	3 %

Table 3.8. Illustrative isolation and Nash results

Romania. Partly due to Bulgaria's increased threat perception in the isolation case, this alliance is accompanied by a considerable drop in the military expenditures of both sides, and an increase in their utility levels.

D. THREE ALLIES SCENARIO

In this scenario, Bulgaria and Romania simultaneously conclude an alliance agreement with the NATO representatives on the Balkan Peninsula--Greece and Turkey. The parameters of all three members in this alliance are shown in Table 3.9. Data for GNP are from Table 2.1 (Appendix A). The perceived commitment from Bulgaria's and Romania's points of view reflect the difference in size and population between Bulgaria and Romania, between Bulgaria and NATO-BP, and between Romania and NATO-BP.

Country	Gi	ai	bi	Pi	Si	Ti	Eij	Eij
Bulgaria	50	0.7	0.2	3	12.5	1.6	0.4	0.12
Romania	115	0.7	0.2	3	28.75	0.5	1	0.3
NATO-BP	220	0.7	0.2	3	55	0.4	1	1

Table 3.9. Illustrative countries' parameters

The method of solving the three allies' scenario is presented in Appendix B. The results of this trilateral alliance are shown in Table 3.10. Looking at the data we can conclude that the change in the external political orientation of the three sides generates a considerable drop in their military expenditures and increases their utility. Among the three sides of the new alliance, Romania has the largest decline in its military expenditures—55 %; Bulgaria has the largest increase in its utility level—18 %. NATO-BP's has a smaller but still substantial decline in military expenditures and increase in utility.

Country		Y	$Y_{(N)}$	X	U	Y/G	$Y_{(N)}/G$	% ΔY	% ΔU
Bulgaria	Isolation	4.02		15.33	2.47	0.08			
	Nash		2.30	15.90	2.92		0.05	43 %	18 %
Romania	Isolation	6.78		36.07	5.82	0.06			
	Nash		3.08	37.31	6.69		0.03	55 %	13%
NATO -	Isolation	12.53		69.16	10.53	0.06			
BP	Nash		8.20	70.60	11.49		0.04	34 %	9 %

Table 3.10. Illustrative isolation and Nash results

E. POTENTIAL BENEFITS FOR BULGARIA

As we saw in the previous section, all of the countries benefit from extending Balkans alliance. It doesn't depend on how many and which countries are included in this future system for collective security. All of the countries have an opportunity to decrease their military expenditures, to increase the consumption of non-defense goods, and consequently to increase their utility levels.

However, it is interesting to compare the potential gains for Bulgaria to its allies in one possible future defense alliance on the Balkan Peninsula. For this purpose, we will use the most probable alliance scenario—scenario (c) from section A, Chapter III. This scenario depicts NATO enlargement on the Balkans as including Bulgaria in this European sub-region. NATO's current Balkan members include Greece and Turkey.

The evaluation of Bulgaria's relative benefit with respect to its possible future allies will be conducted as follows:

1. Bulgaria's relative benefits with variable GNP

Figure 3.2 and Table 3.11 (Appendix C) show the difference in military expenditures as percent of GNP (ME/GNP) between Bulgaria and NATO-BP for the Nash

alliance case. The figure also shows the cross-country differences in the percentage change in military expenditures (Y) and utility levels (U) between the Nash and isolation cases. When one of these three measures is higher than zero, it indicates a lower benefit for the second side of the alliance—the current NATO members Greece and Turkey.

The variable—NATO countries' GNP—varies from 180 to 250 billion constant 1995 dollars.

Figure 3.2 shows, that despite the change of NATO-BP's GNP, the difference in utility levels favors Bulgaria. This is valid for the whole range and the difference increases with increases in NATO-BP's GNP. In the first third of the range, the difference in percentage change in military expenditures for the both sides favors NATO-BP; when NATO-BP's GNP exceeds $204 billion, the relative change in military expenditures favors Bulgaria. The difference in military expenditures per GNP always favors NATO-BP.

Figure 3.3 and Table 3.12 (Appendix C) show the same measures as Figure 1, but this time Bulgaria's GNP varies. The cross-country differences in the percentage change in utility levels favors Bulgaria; it becomes zero when Bulgaria's GNP exceeds $ 65 billion. The same pattern hold for the cross-country differences in the percentage change in military expenditures between the Nash and isolation cases. This parameter favors Bulgaria until its GNP becomes $ 56 billion. Beyond this level, the parameter favors NATO-BP. Regardless the change of Bulgaria's GNP, the difference in military expenditures as percent of GNP favors NATO-BP, as in the previous case.

2. Bulgaria's relative benefits with variable threat perception

Figure 3.4 and Table 3.13 (Appendix C) present the same measures as above, but this time the threat perception varies for the NATO Balkan countries. The graphs show that the cross-country differences in the percentage change in military expenditures and utility levels between the isolation and Nash cases always favors Bulgaria; these differences increase as the NATO-BP's threat perception increases.

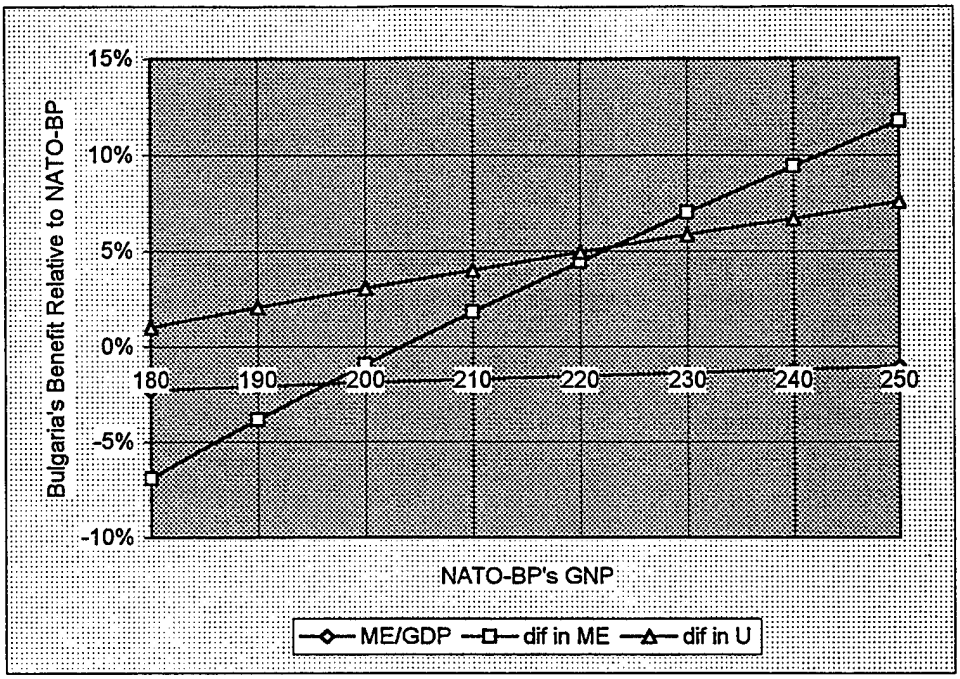

Figure 3.2. Bulgaria's benefit measures with variable G2

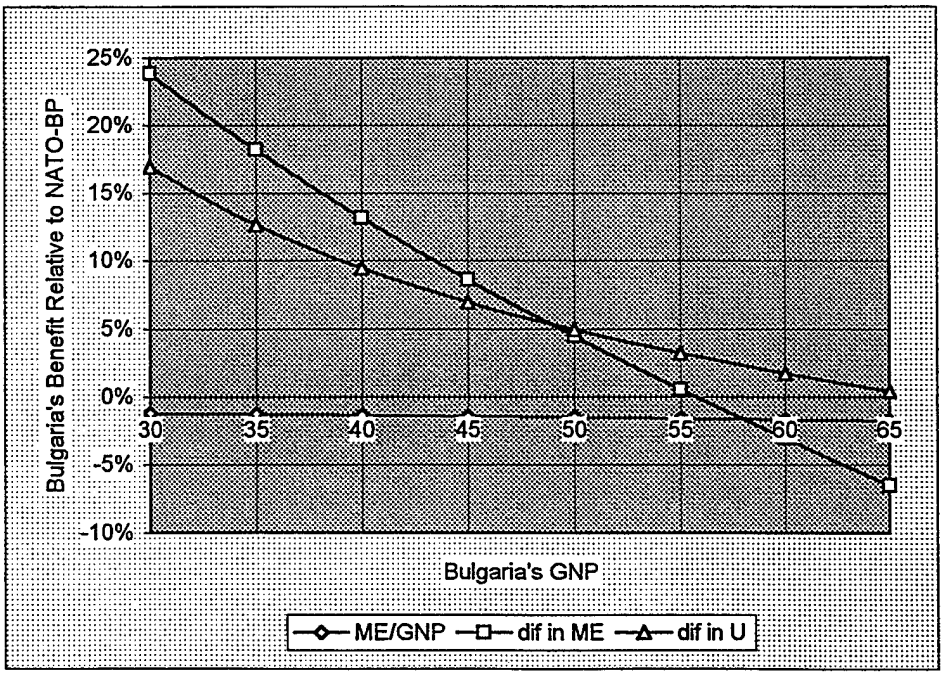

Figure 3.3. Bulgaria's benefit measures with variable G1

The difference between the military expenditures as percent of GNP for the both sides after concluding an alliance favors NATO-BP. However, as their threat perception increases, this difference decreases; Bulgaria's decrease in military expenditures tends to equal the decrease in military expenditures of the NATO countries on the Balkan Peninsula.

3. Bulgaria's relative benefits with variable E12

The theoretical model in Chapter III assumed that Bulgaria's perceived commitment from its allies is proportional to the ratio between the geographical sizes and populations of both allies. Since the density of the population in all of the countries in this sub-region is similar, it is possible to present the perceived commitment as function of the geographical sizes of the countries. It is interesting to see what happens with the three measures of Bulgaria's relative benefit when E_{12} varies and doesn't reflect relative size. The results are presented in Figure 3.5 and Table 3.14 (Appendix C).

The cross-country difference in the percentage change in utility levels as E_{12} varies from 0.08 to 0.2 is positive for Bulgaria; it increases as the perceived commitment increases. The cross-country difference in the percentage change in military expenditures also increases with E_{12}; this difference favors Bulgaria when the perceived commitment is at least 0.1. The difference in military expenditures between Bulgaria and NATO-BP favors NATO-BP until it becomes zero (equal military expenditure reductions for the both sides) when the perceived commitment E_{12} is 0.2 .

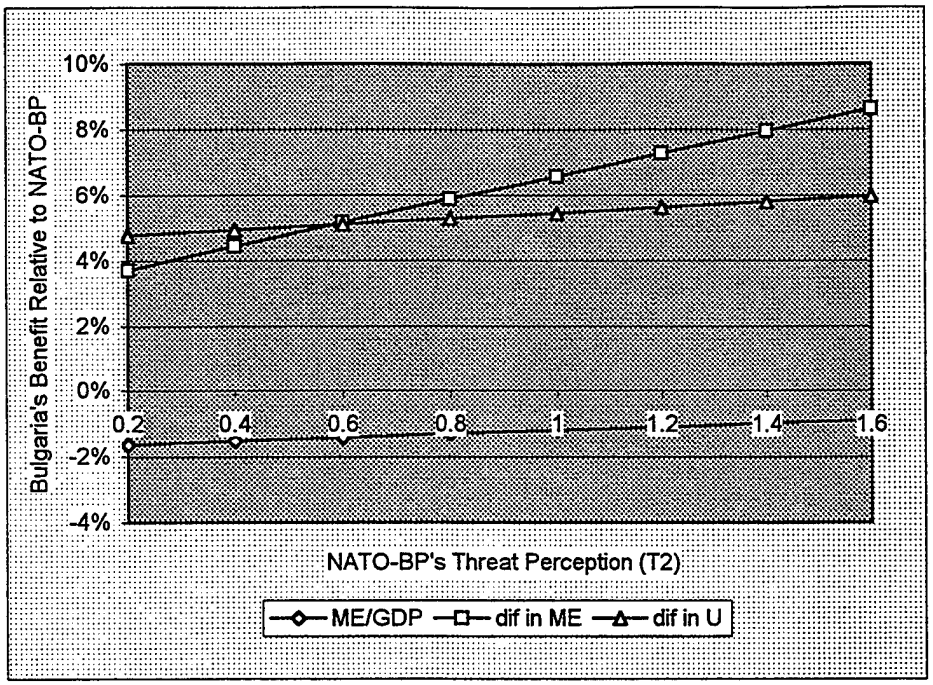

Figure 3.4. Bulgaria's benefit measures with variable T2

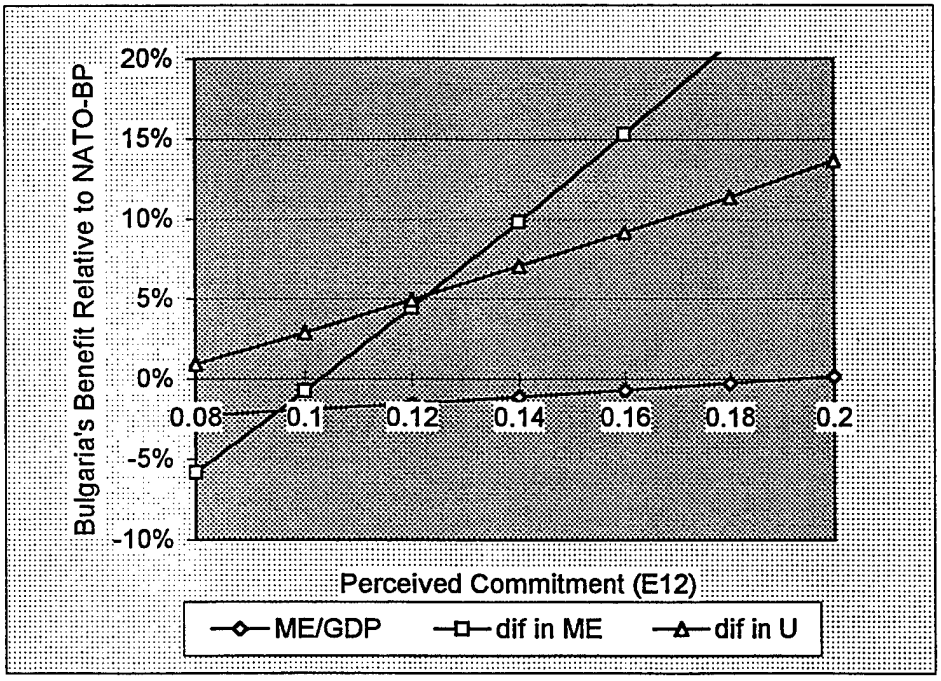

Figure 3.5. Bulgaria's benefit measures with variable E12

IV. CONCLUDING OBSERVATIONS

A. SUMMARY OF FINDINGS

1. The only possible choice

In the post Cold war era, after the dissolution of Warsaw Pact and COMECOM, Bulgaria feels insecure. The reason for this insecurity is a combination of geostrategic and domestic factors. External factors include Bulgaria's position within the traditionally volatile Balkan region, which is marked by long-standing disputes and bitter rivalries. Internally the country is undergoing a simultaneous transition of both its economic and political systems, with the goal of integrating into Western political, military, and economic structures.

There are three possible solutions for Bulgaria's national security problems: creating a Bulgarian neutrality system; integrating the country in the emerging European Security and Defense Identity (ESDI); and including Bulgaria in NATO. Assuming the obstacles for creating a viable neutrality status in this European region and the impossibility of waiting to establish ESDI, the only possible alternative for guaranteeing of Bulgaria's national security is joining NATO.

Bulgaria's decision for full membership in the Euro-Atlantic structure has its political, military-strategic, financial-economic, and social and legal consequences. Most of these consequences are favorable for the country and they fully offset the negative implications of this decision.

2. Bulgaria and its neighbors

During the last few years, the situation on the Balkan Peninsula has become more complicated. With the implementation of the Cascade Plan under the CFE Treaty, the existing balance of the armed forces in this part of Europe changed. The imbalance in the

armed forces of Bulgaria vis a vis its neighbors constitutes a direct risk to the security of the country. Considering the history of the Balkans and the ongoing problems in Yugoslavia, despite the economic crisis, Bulgaria makes a disproportionate unilateral investment relative to other countries in the region to maintain a military budget to guarantee a subsistence level of security.

3. Alliances and benefits

After concluding an alliance with its former adversaries, as a result of the perceived value of allied defense inflows, the defense expenditures of the newly allied countries decrease. This drop depends on the level of commitment between the alliance and the new ally and relative economic performance. As the allies' military expenditures decrease, they have an opportunity to increase their non-defense goods. This increases their utility levels.

Table 4.1 presents the changes in Bulgaria's consumption of non-defense goods (X), defense goods (Y), and utility (U) as a result of joining an alliance in five different scenarios (Chapter III, A, 2). Military expenditures as a percent of GNP (Y/G), the decline in defense expenditures (% ΔY), and the increase of utility (% ΔU) are presented as well.

Bulgaria	X	Y	U	Y/G	% ΔY	% ΔU
Basic case	15.33	4.02	2.47	8.0 %	--	--
Scenario a)	15.99	2.04	2.99	4.1 %	49 %	21 %
Scenario b)	15.56	3.33	2.65	6.7 %	17 %	7 %
Scenario c)	15.64	3.08	2.72	6.2 %	24 %	10 %
Scenario d)*	15.61	3.18	2.69	6.4 %	27 %	13 %
Scenario e)	15.90	2.30	2.92	4.6 %	43 %	18 %

Table 4.1. Illustrative results for Bulgaria at different scenarios

d)*—It is difficult to use the results from this scenario for comparisons because NATO-BP is presented not only by its current members, but also by a third member—Romania.

Independent of the scenario, when Bulgaria enters a political-military alliance with its neighbors, it always improves the country's welfare indicators compared to the basic (isolation) case. Despite the impossibility of some integration scenarios, they still illustrate the consistency of outcome from this decision. More specifically, the two most realistic scenarios: (c)—including of Bulgaria as part of NATO's Balkan membership; and (e)—simultaneously including Bulgaria and Romania in NATO-BP, provide favorable results for Bulgaria.

It is interesting to ask if the current NATO Balkan Peninsula members (Greece and Turkey) benefit from these alliances. Table 4.2 shows that in scenarios (c) and (e), NATO-BP has a substantial decrease in its military expenditures and a modest increase in utility.

NATO-BP	X	Y	U	Y/G	% ΔY	% ΔU
Basic case	69.16	12.53	10.53	5.7 %	--	--
Scenario c)	69.95	10.14	11.06	4.6 %	19 %	5 %
Scenario e)	70.60	8.20	11.49	3.7 %	34 %	9 %

Table 4.2. Illustrative results for NATO-BP at different scenarios

The results for NATO-BP are better when it forms an alliance with a bigger ally (Bulgaria and Romania simultaneously). The new allies jointly commit more military expenditures to the alliance compared to scenario (c), when only one country (Bulgaria) joins NATO.

4. Bulgaria's relative benefits

Evaluating the difference in military expenditures as percent of GNP between Bulgaria and NATO-BP for the alliance case (c) and the cross-country differences in the percentage change in military expenditures and utility levels between the alliance and

isolation case, we see that Bulgaria's relative benefits are somewhat higher compared to its future allies. This is a consequence mainly of Bulgaria's disproportionately large military expenditures in the isolation case and its small relative GNP.

B. PROBLEMS ENCOUNTERED

1. GNP of the countries

Calculating the benefits for the countries situated on the Balkans after joining in a system for common security required data for their budget constraints. GNP is presented as a measure of these budget constraints in the thesis, using Purchasing Power Parity (PPP) to convert to a common currency. Unfortunately this measure doesn't present the real value of Bulgaria's GNP. When we add the so-called "economy in shadow" (according to some estimations approximately 35% of GNP) we see that some results are not reliable.

This thesis also assumed that all of the countries are identical in their structure: the elasticity of non-defense and defense goods; the price of private goods relative to defense goods; and the relative minimum non-defense consumption requirements. Of course this equality is unrealistic. Using different values for all countries we will modify the results. However, the new results will not change the logic of improvements after concluding an alliance between former adversaries.

2. Perceived threat

To calculate country i's utility function (equation 2.5), it was necessary to know its minimum total defense requirements, or the threat perception of this country. This threat perception is connected with: the size of the neighbor (former adversary and future ally); its budget and military spending; the history of destructive wars and invasions; existence of national minorities in the country; the type of government (democratic or totalitarian).

If there were only two states or groups of states, it would be relatively easy to define some data for threat perceptions across states. However, there are many countries on the Balkan Peninsula and all of them have at least four neighbors. Some of the countries mentioned in the analysis, like Turkey or Romania, have neighbors who are situated outside the Balkans. It is very difficult to assess what part of the military expenditures of a particular country are directed against potential adversaries on the Balkan Peninsula.

A further complication is introduced by the tensions between the current NATO members on the Balkans, Greece and Turkey. In this thesis, however, it is impossible to evaluate the impact of these tensions on the military expenditures of these two countries.

3. Commitment from the allies

The commitment between allies in this analysis reflects the ratio between their sizes and populations. In the scenario when Bulgaria joins NATO-BP, the population and size of NATO's Balkan members (Greece and Turkey) is eight times bigger than the population and size of Bulgaria. If Bulgaria's perceived commitment from its NATO-BP allies is different than 0.12, the benefit of the alliance will change dramatically (Figure 3.5).

4. Assessing the advantages

This thesis presents results concerning military cooperation of different countries on the Balkans. For all countries, and especially for Bulgaria, benefits are connected with decreasing military expenditures, increasing consumption of non-defense goods, and increasing utility levels. However, it is very difficult to assess all of the consequences for Bulgaria from integration in NATO. How exactly this will reflect on the stability of the region, to what extend this will promote Bulgaria's membership in the European Union, and how this will affect foreign investments in the country, are all unanswered questions.

In addition, it is impossible to estimate how the geopolitical location of Bulgaria will influence the flow of goods through the country and how this will affect the GNP. We

may make only assumptions about how increasing the output of Bulgaria's defense industry, that has the highest potential on the Balkans, will affect the country's economy.

5. Evaluation of expenditures for joining NATO

In Chapter I, the costs of NATO enlargement for Bulgaria are estimated at $300-400 million over the first ten years. This sum is calculated in analogy with the case of the first three invitees from Eastern Europe. Similarly to the countries included in the initial NATO enlargement, Bulgaria will pay just a portion of this sum—approximately $100 million.

Comparing this expenditure with the benefits of including of Bulgaria in the system for common security (decreasing the military expenditures by $1 billion annually) we see that the benefits (cost savings) are much higher than the costs. The problem is that we have not estimated the actual expenditures for joining NATO; this comparison may be inaccurate.

C. RECOMENDATIONS

1. National security at lower cost

The long-term prospects for reform in Bulgaria rely on the West's recognition that isolating Bulgaria and the Balkan region from the Euro-Atlantic structures is inherently destabilizing for European security. The Continent will be integrated when all walls come down, whether political, economic, or military.

Every country has armed forces as an element of national security, but security cannot be ensured by military might alone. Indeed, excessive investment in military power can lead to economic disaster. It is in everyone's interest to reduce tension and to reduce the perceived need for a nation to spend money on military resources. A system for common security, like NATO, can reduce defense expenditures among its member states.

By combining efforts in the Alliance, the Balkan countries can maintain their sovereignty and military systems, but at lower level of strength, and assure their national security at lower cost.

2. Broader enlargement of the Alliance

Most of the Balkan states formed the borderline between the former Warsaw Pact and NATO. The material consequences of this still weighs heavily on their armed forces and taxpayers. Bulgaria now enjoys good neighborly relations with all countries in the region. If we are partners and allies with them today, sharing the same vision of the future, tomorrow we shall be allies in the full sense of the term. Future NATO enlargement on the Balkans should include as many states as possible. Extending the Euro-Atlantic structures to Bulgaria and Romania, and in the future to the rest of the Balkan countries, will substantially decrease military spending in all of the countries and simultaneously enhance their security.

3. Economic cooperation

There is nothing more urgently needed than a real effort to build stability through cooperation in Southeastern Europe. This will determine the future of the Balkans. There is a growing recognition among the countries in the region that they need to coordinate their efforts to ensure long-term stabilization and economic dynamism. Economic reconstruction and reintegration into the world economy enhance stability; stability breeds dynamic economic growth and business opportunities. Bulgaria and its neighbors have to be ready to provide their own contributions for this purpose.

The Balkan Peninsula's stability and security are of crucial importance for Europe and, indeed, the world. This is not overstating the obvious but is a real interpretation of the situation. If the Euro-Atlantic community is genuinely determined to contain future conflicts on religious or ethnic grounds, this is the region and the time where we could both prove and test this commitment. Accomplishing this historic mission is Bulgaria's mission for the future of the Balkans.

APPENDIX A. GNP, ARMED FORCES, AND MILITARY EXPENDITURES

Year	GNP by country in constant bill $ 1995				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	56.5	76.1	136.1	106.4	138.1
1986	58.0	77.0	138.2	116.0	140.2
1987	58.1	76.8	135.4	128.1	122.8
1988	59.9	80.5	140.3	131.6	138.4
1989	59.4	83.0	135.8	130.3	135.1
1990	52.0	82.5	120.6	142.3	121.4
1991	40.8	85.6	104.1	144.5	102.6
1992	39.7	86.4	88.2	152.5	14.5
1993	37.7	87.5	89.8	164.6	15.0
1994	37.8	88.8	93.4	156.8	17.0
1995	37.7	91.2	98.9	166.7	20.6

Table 2.1. Gross National Product by country

Year	Population by country in millions				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	8.9	9.9	22.5	50.7	23.1
1986	9.0	10.0	22.5	51.8	23.3
1987	9.0	10.0	22.6	52.9	23.4
1988	9.0	10.0	22.7	54.0	23.6
1989	9.0	10.0	22.8	55.1	23.7
1990	9.0	10.1	22.8	56.1	23.8
1991	8.9	10.3	22.7	57.2	23.9
1992	8.9	10.3	22.7	58.3	10.5
1993	8.5	10.4	22.4	59.3	10.5
1994	8.5	10.4	22.2	60.4	10.5
1995	8.6	10.5	21.9	61.4	10.6

Table 2.2. Population by country

Year	GNP per capita in constant thousand $ 1995				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	6.3	7.7	6.1	2.1	6.0
1986	6.5	7.7	6.1	2.2	6.0
1987	6.5	7.7	6.0	2.4	5.2
1988	6.7	8.0	6.2	2.4	5.9
1989	6.6	8.3	6.0	2.4	5.7
1990	5.8	8.1	5.3	2.5	5.1
1991	4.6	8.3	4.6	2.5	4.3
1992	4.5	8.4	3.9	2.6	1.4
1993	4.4	8.4	4.0	2.8	
1994	4.4	8.5	4.2	2.6	
1995	4.4	8.7	4.5	2.7	1.9

Table 2.3. Gross National Product per capita

Year	Military expenditures by country in constant bill $ 1995				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	7960	5343	9374	4890	5085
1986	8295	4787	9422	5676	5538
1987	8350	4863	9688	4230	5049
1988	7326	5052	8745	3860	5195
1989	7051	4786	8287	4049	3736
1990	4467	4806	4446	4968	4891
1991	1618	4625	4140	5388	3986
1992	1286	4882	2874	5849	3867
1993	1090	4845	1889	6406	
1994	1007	4932	2233	6322	2973
1995	1073	5056	2520	6606	

Table 2.4. Military expenditures by country

Year	Military Expenditures per GNP in % by country				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	14.1	7.0	6.9	4.6	3.7
1986	14.3	6.2	6.8	4.9	3.9
1987	14.4	6.3	7.2	3.3	4.1
1988	12.2	6.3	6.2	2.9	3.8
1989	11.9	5.8	6.1	3.1	2.8
1990	8.6	5.8	3.7	3.5	4.0
1991	4.0	5.4	4.0	3.7	3.9
1992	3.2	5.7	3.3	3.8	
1993	2.9	5.5	2.1	3.9	
1994	2.7	5.6	2.4	4.0	
1995	2.8	5.5	2.5	4.0	

Table 2.5. Military expenditures per GNP by country

Year	Military Expenditures per capita in constant $ 1995				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	890.0	538.0	417.0	97.0	220.0
1986	926.0	480.0	418.0	110.0	238.0
1987	931.0	487.0	428.0	80.0	216.0
1988	816.0	505.0	385.0	72.0	220.0
1989	784.0	477.0	364.0	74.0	158.0
1990	498.0	475.0	195.0	89.0	205.0
1991	181.0	450.0	182.0	94.0	167.0
1992	145.0	472.0	127.0	100.0	
1993	128.0	466.0	84.0	108.0	
1994	118.0	472.0	101.0	105.0	282.0
1995	125.0	482.0	115.0	108.0	

Table 2.6. Military expenditures per capita

Year	Armed forces by country in thousands				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	189	201	237	814	258
1986	190	202	238	860	234
1987	191	199	248	879	234
1988	160	199	220	847	229
1989	150	201	207	780	225
1990	129	201	126	769	180
1991	107	205	201	804	169
1992	99	208	172	704	137
1993	52	213	167	686	100
1994	80	206	200	811	130
1995	86	213	209	805	130

Table 2.7. Armed forces by country

Year	Armed Forces per 1,000 people [soldiers]				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	21.2	20.2	10.5	16.1	11.2
1986	21.2	20.3	10.5	16.6	10.0
1987	21.3	19.9	11.0	16.6	10.0
1988	17.8	19.9	9.7	15.7	9.7
1989	16.6	20.0	9.1	14.2	9.5
1990	14.4	19.9	5.5	13.7	7.6
1991	12.0	19.9	8.8	14.1	7.1
1992	11.2	20.1	7.6	12.1	13.1
1993	6.1	20.5	7.4	11.6	9.5
1994	9.4	19.7	9.0	13.4	12.3
1995	10.0	20.3	9.5	13.1	12.3

Table 2.8. Armed forces per 1,000 people

Year	Arms Imports in million constant $ 1995				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	1302.0	397.0	55.0	685.0	41.0
1986	1735.0	280.0	667.0	934.0	53.0
1987	906.0	453.0	155.0	1553.0	809.0
1988	499.0	718.0	37.0	1373.0	62.0
1989	347.0	2277.0	12.0	1438.0	144.0
1990	776.0	506.0	948.0	1379.0	11.0
1991	0.0	287.0	188.0	1326.0	6.0
1992	0.0	780.0	32.0	1076.0	0.0
1993	5.0	891.0	0.0	1258.0	0.0
1994	0.0	482.0	0.0	1128.0	0.0
1995	0.0	825.0	0.0	700.0	0.0

Table 2.9. Arms imports by country

Year	Arms Exports in million constant $ 1995				
	Bulgaria	Greece	Romania	Turkey	Yugoslavia
1985	822.0	41.0	603.0	164.0	617.0
1986	601.0	53.0	440.0	0.0	414.0
1987	777.0	52.0	324.0	13.0	427.0
1988	537.0	25.0	275.0	12.0	312.0
1989	288.0	0.0	96.0	24.0	264.0
1990	92.0	23.0	0.0	11.0	322.0
1991	122.0	0.0	0.0	33.0	210.0
1992	129.0	20.0	22.0	22.0	0.0
1993	84.0	10.0	10.0	21.0	0.0
1994	62.0	5.0	41.0	31.0	0.0
1995	150.0	0.0	20.0	60.0	0.0

Table 2.10. Arms exports by country

APPENDIX B. SOLVING OF THREE ALLIES' SCENARIO

Parameter Table:

Country	Budget Gi	Utility param ai	bi	Pi	Si	Ti	ci	di	Eij	Eij
Bulgaria	50	0.7	0.2	3	12.5	1.6	78%	0.22	0.4	0.12
Romania	115	0.7	0.2	3	28.75	0.5	78%	0.22	1	0.3
NATO-BP	220	0.7	0.2	3	55	0.2	78%	0.22	1	1

Perceived commitment from each country included in the model:

E12=0.4 E21=1 E31=1 E13=0.12 E23=0.3 E32=1

ci=ai/(ai+bi)
di=bi/(ai+bi)

Country i's total consumption of defense goods:

$Z_i = Y_i + \Sigma E_{ij} * Y_j$

Military expenditures:

$Y_i = d_i * (G_i - P_i * S_i) + c_i * T_i$ - Individual ME
$Y_{i(N)} = Y_i - c_i * (\Sigma E_{ij} * Y_j)$ - Nash ME

Vector of countries' military expenditures:

$\mathbf{Y} = \mathbf{A} * \mathbf{Y}_{(N)}$

$Y1 = Y1_{(N)} + c1 * E12 * Y2_{(N)} + c1 * E13 * Y3_{(N)}$
$Y2 = c2 * E21 * Y1_{(N)} + Y2_{(N)} + c2 * E23 * Y3_{(N)}$
$Y3 = c3 * E31 * Y1_{(N)} + c3 * E32 * Y2_{(N)} + Y3_{(N)}$

Vector of countries' Nash militaryexpenditures:

$\mathbf{Y}_{(N)} = Inv(\mathbf{A}) * \mathbf{Y}$

Elements of matrix A:

A11=1	A12=c1*E12	A13=c1*E13
A21=c2*E21	A22=1	A23=c2*E23
A31=c3*E31	A32=c3*E32	A33=1

Matrix **A**

	1	2	3
1	1.00	0.31	0.09
2	0.78	1.00	0.23
3	0.78	0.78	1.00

B62=INDEX(MINVERSE(B49:D51),1,1)
B63=INDEX(MINVERSE(B49:D51),2,1)
. . . . . .
D64=INDEX(MINVERSE(B49:D51),3,3)

Inverse of **A**

	1	2	3
1	1.33	-0.39	-0.03
2	-0.97	1.50	-0.26
3	-0.28	-0.87	1.23

Vector **Y**

4.02
6.78
12.38

$Y_{(N)}$
2.30
3.08
8.20

B68=MMULT(B62:D62,F62:F64)
B69=MMULT(B63:D63,F62:F64)
B70=MMULT(B64:D64,F62:F64)

Table of results:

Country	Case	Y	$Y_{(N)}$	X	U	Y/G	$Y_{(N)}$/G	% dY	% dU
Bulgaria	Isolation	4.02		15.33	2.47	0.08			
	Nash		2.30	15.90	2.92		0.05	0.43	0.18
Romania	Isolation	6.78		36.07	5.82	0.06			
	Nash		3.08	37.31	6.69		0.03	0.55	0.13
NATO-BP	Isolation	12.38		69.21	10.57	0.06			
	Nash		8.20	70.60	11.49		0.04	0.34	0.09

APPENDIX C. BULGARIA'S RELATIVE BENEFITS

G2	ME/GNP	Δ in ME over isolation	Δ in U over isolation
180	-2%	-7%	1%
190	-2%	-4%	2%
200	-2%	-1%	3%
210	-2%	2%	4%
220	-2%	4%	5%
230	-1%	7%	6%
240	-1%	9%	7%
250	-1%	12%	8%

Table 3.11. Bulgaria's benefit measures with variable G2

Where: G2 – GNP of NATO-BP (Greece and Turkey),

$ME/GNP = | Y_1/G_1 - Y_2/G_2 |$,

Difference in ME over isolation = $\Delta Y_1 - \Delta Y_2$,

Difference in Utility over isolation = $\Delta U_1 - \Delta U_2$.

G1	ME/GNP	Δ in ME over isolation	Δ in U over isolation
30	-1%	24%	17%
35	-1%	18%	13%
40	-1%	13%	9%
45	-1%	9%	7%
50	-2%	4%	5%
55	-2%	1%	3%
60	-2%	-3%	2%
65	-2%	-7%	0%

Table 3.12. Bulgaria's benefit measures with variable G1

Where: G1 – GNP of Bulgaria.

T2	ME/GDP	Δ in ME over isolation	Δ in U over isolation
0.2	-2%	4%	5%
0.4	-2%	4%	5%
0.6	-1%	5%	5%
0.8	-1%	6%	5%
1.0	-1%	7%	5%
1.2	-1%	7%	6%
1.4	-1%	8%	6%
1.6	-1%	9%	6%

Table 3.13. Bulgaria's benefit measures with variable T2

Where: T2 – the threat perception of NATO-BP.

E_{12}	ME/GDP	Δ in ME over isolation	Δ in U over isolation
0.08	-2%	-6%	1%
0.10	-2%	-1%	3%
0.12	-2%	4%	5%
0.14	-1%	10%	7%
0.16	-1%	15%	9%
0.18	0%	21%	11%
0.20	0%	27%	14%

Table 3.14. Bulgaria's benefit measures with variable E_{12}

Where: E12 – the perceived commitment from NATO-BP.

LIST OF REFERENCES

1. Dixit, A. K. and Nalebuff, B. J., *Thinking Strategically*, W. W. Norton & Company, 1993.

2. Gordon, P. H., *NATO's Transformation*, Rowman & Littlefield Publishers, Inc., 1997.

3. Gillis, M., Perkins, D. H., Roemer, M., and Snodgrass, D. R., *Economics of Development*, W. W. Norton & Company, 1992.

4. Kaplan, L. S., *NATO and the United States*, Twayne Publishers, 1994.

5. Olvey, L. D., Golden, J. R., and Kelly, R. C., *The Economics of National Security*, Avery Publishing Group, Inc., 1984.

6. Payne, J. E. and Sahu, A. P., *Defense Spending & Economic Growth*, Westview Press, 1993.

7. Ratchev, V., *Bulgaria in NATO: Aspects of Motivation*, Research report, Bulgaria, 1997.

8. Solana, J., *European Security With an Enlarged NATO*, Keynote speech at the conference on "NATO Enlargement," Rome, 3 Oct. 1997.

9. Terasawa, K. L. and Gates, W. R., *Allies, Adversaries and Commitment in Defense Alliances*, Naval Postgraduate School, Monterey, CA, Sept. 1990.

10. Terasawa, K. L. and Gates, W. R., *Alliance Burden Sharing*, Naval Postgraduate School, Monterey, CA.

11. Weimer, D. L. and Vining, A. R., *Policy Analysis: Concepts and Practice*, Prentice Hall, 1992

12. *World Military Expenditures and Arms Transfers*, US Arms Control and Disarmament Agency, 1995.

13. *The Alliance Strategic Concept*, approved by the state and government leaders, attended the NATO meeting in Rome, 7-8 June 1991

14. *Report to the Congress on the Military Requirements and Costs of NATO Enlargement*, February 1998.

INITIAL DISTRIBUTION LIST

Number of copies

1. Defense Technical Information Center 2
   8725 John J. Kingman Rd., Suite 0944
   Ft. Belvour, VA 22060-6218

2. Dudley Knox Library 2
   Naval Postgraduate School
   411 Dyer Rd.
   Monterey, CA 93943-5100

3. Professor Katsuaki L. Terasawa, Code SM/TK 1
   Department of Systems Management
   Naval Postgraduate School
   Monterey, CA 93943

4. Professor William R. Gates, SM/GT 1
   Department of Systems Management
   Naval Postgraduate School
   Monterey, CA 93943

5. LTC Pavlin T. Roussanov 3
   1-A "Gen. Kolev" Str., Apt. 2
   Pleven 5800
   Bulgaria

6. Library 2
   Air Force Academy
   D. Mitropolia
   Obl. Lovetch
   Bulgaria